

# EDUCATION AS AESTHOECOLOGY

Submitted by **Christopher Paul Turner** to the University of Exeter as a thesis for the degree of Doctor of Education in Education, May 2019.

This thesis is available for Library use on the understanding that it is copyright material and that no quotation from the thesis may be published without proper acknowledgement.

I certify that all material in this thesis which is not my own work has been identified and that any material that has previously been submitted and approved for the award of a degree by this or any other University has been acknowledged.

Signed

C. P. Turner

# Abstract

This thesis investigates the significance of aesthetics and ecology for education. Both these topics are considered in detail from a number of different perspectives including their social and philosophical emergence as significant entities since the 19th century. Their particular significance in more recent years is discussed within the framework of posthumanism and new materialism, in order to postulate the contribution that they might make to educational futures.

An autoethnographic and theoretical approach has been used to frame the arguments for the importance of aesthetics and ecology. Using experiences from personal education practice, I examine the ways in which the complex interrelationship between aesthetics and ecology might influence educational debate and how this might fundamentally underpin any consideration of affective and emergent education philosophy.

I argue that aesthetics and ecology might combine as a symbiotic entity. In this form its impact for education might be even more pervasive. This new organic entity, for which I have formulated the term aesthoecology, operates in its most dynamic form when mediated by a rhythmicity that maximises the affective and connected characteristics of the relationship between the two. Fundamental to the impact of aesthoecology is its role in processes of transformation in nature and culture. Features of this transformation such as symmetrical form, liminality and anticipation are considered from a theoretical perspective subsequent to locating them in the dimensions of space, place and time.

The importance of the theoretical construction of aesthoecology is considered as the starting point for its potential application to education within a world that is experiencing significant and unprecedented challenges. Specific reference is given to examples of education practice that might illuminate the theory of aesthoecology, particularly from my personal interest in museums and galleries and from extensive school and community education experience.

The thesis concludes with an invitation to education practitioners to reflect upon and consider significant elements of aesthoecological theory to experiment with and apply to the transformational processes within their own practice.

# Acknowledgements

I owe a great debt of gratitude to a wide range of people for their stimulus, interest, support and tolerance during the period that has led to the production of this thesis.

Pivotal to inspiring, supporting and challenging the synthesis of this theory has been my first supervisor, Dr Deborah Osberg, who has encouraged me to think differently, and has been hugely influential in helping me to find the language within which to explore my ideas. Thanks also to my other key supervisor, Dr Emese Hall, who so gently and diplomatically kept my educational feet on the ground during my wilder flights of theoretical fancy and helped so much in the sensible framing and practical construction of the thesis. I was also fortunate to have the expertise of a third supervisor, Dr Hermione Ruck-Keene, for the final months, who brought a fresh and critical perspective to the accuracy of the final product. I am very grateful to all of them.

I am also extremely grateful to the friends that I have made during my period of research. Fellow researchers and PGR's with whom I have shared my research journey have been invaluable in their support of my transition from practitioner to philosophical theoretician and for helping me to balance the two.

I recognise the support of my wonderful family during these past six years, most particularly that of my partner, Georgina, who has had to tolerate the times when I have shut myself away in order to write and read for long periods and to listen endlessly to my developing ideas. Her proofreading skills have been invaluable to me and her forbearance has, at times, been tested to extremes.

During the time that I have been occupied with my doctoral studies, my first three grandchildren have been born. I sincerely hope that they may grow up benefitting from an education that has the philosophy of aesthoecology deeply embedded within it.

Finally, I dedicate this thesis to my father, Os Turner (1923-2006), who has been a profound inspiration for my conception of aesthoecology. His love of the natural world, his skill at conveying that through his wood engravings and his nurturing of both the aesthetic and ecological in me, have been the foundation for my thinking and research.

# Table of Contents

Abstract .....	2
Acknowledgements .....	3
Table of Figures .....	6
Chapter 1 – Introduction .....	7
1.1 Intentions .....	7
1.2 Ecology and aesthetics .....	8
1.3 Dynamic symbiosis.....	9
1.4 Global and local challenges .....	10
1.5 The derivation of aesthoecology .....	11
1.6 Research approach and methodology .....	12
1.7 Thesis contents .....	14
Chapter 2 – Setting the Scene: An Auto-ethnographic Perspective as an Introduction to the Research Study .....	16
2.1 Introduction.....	16
2.2 Early influences in natural history .....	16
2.3 From natural history to science .....	23
2.4 A career in education .....	26
2.5 Particular examples of curriculum initiatives .....	32
2.6 Personal experiences influencing an interest in aesthetics .....	36
2.7 Summary .....	40
Chapter 3 – The Theoretical Research Framework in the Context of Posthumanism and New Materialism .....	43
3.1 Introduction.....	43
3.2 Evidence-based practice .....	43
3.3 Autoethnography as methodology and consideration of researcher positionality.....	45
3.4 Transformative listening and reading .....	49
3.5 Aesthoecology: metaphorical and ethical dimensions .....	54
3.6 Holism and interconnectivity.....	57
3.7 Posthumanism: a new relationship with the material world .....	61
3.8 Summary .....	64
Chapter 4 – Crossing Boundaries and Emerging Landscapes .....	66
4.1 Introduction.....	66
4.2 Nature and culture: an educational contention.....	67
4.3 Theories of learning and education .....	71
4.4 Museums and galleries cohabiting with educational emergence.....	78

4.4 The science of art and the art of science: breaking down the divisions and seeing beyond the connections .....	89
4.5 Summary .....	96
<b>Chapter 5 – Aesthetics and Ecology: Separate Entities yet in Affinity .....</b>	<b>97</b>
5.1 Introduction.....	97
5.2 The trilobe synoptique .....	99
5.3 Aesthetics and affectivity.....	101
5.4 Ecology and connectivity.....	108
5.5 Anticipation and rhythmicity.....	117
5.6 Summary .....	120
<b>Chapter 6 – Aesthetics and Ecology: A Symbiotic Relationship .....</b>	<b>121</b>
6.1 Introduction.....	121
6.2 Aesthetics and ecology: a further turn to posthumanism and new materialism .....	122
6.3 Aesthetics and ecology: symmetry and transformation .....	125
6.4 Liminality and transformation: affect and aesthetic events .....	131
6.5 Aesthetics and ecological rhythmicity .....	134
6.6 Summary .....	136
<b>Chapter 7 – Aesthoecology as Affective Anticipation .....</b>	<b>138</b>
7.1 Introduction.....	138
7.2 What is anticipation? .....	139
7.3 Anticipation in a normative educational context.....	140
7.4 Symbiotic, emergent and affective anticipation.....	143
7.5 Affective anticipation in practice .....	145
7.6 Summary .....	148
<b>Chapter 8 – Conclusion and an Aesthoecological View of Education .....</b>	<b>150</b>
8.1 Introduction.....	150
8.2 Emergent values of aesthoecology .....	152
8.3 Contribution to knowledge.....	153
8.4 Further research and recommendations for policy and practice.....	155
8.5 Final words .....	157
<b>Glossary .....</b>	<b>158</b>
<b>Bibliography.....</b>	<b>165</b>

# Table of Figures

<i>Figure 1: Wood Engraving, 'Spring', by Os Turner, 1989 .....</i>	<i>20</i>
<i>Figure 2: Wood Engraving, 'Bird's Eye View', by Os Turner, 1992 .....</i>	<i>21</i>
<i>Figure 3: 'Reclining Figure' by Henry Moore, 1979 [Photograph by Ron Ellis].....</i>	<i>22</i>
<i>Figure 4: 'Draped, Seated Woman' by Henry Moore, 1957-58 .....</i>	<i>22</i>
<i>Figure 5: Wood mouse (Apodemus sylvaticus) [Photograph by Rudmer Zwerver] .....</i>	<i>25</i>
<i>Figure 6: Facade of a merchant house, illustrating Venetian Gothic architecture [Photograph by Natalia Bratslavsky].....</i>	<i>37</i>
<i>Figure 7: Planet Earth (image from Nasa), illustrating Gaia [Photograph by Aphelleon] .....</i>	<i>56</i>
<i>Figure 8: Rocky shoreline – liminal zone between sea and shore [Photograph by Dom 1530].....</i>	<i>68</i>
<i>Figure 9: 'Trilobe synoptique' by Charles Lacouture [Copyright approved from The Pattern Book Company] .....</i>	<i>99</i>
<i>Figure 10: Gothic cloisters, Glasgow University [Photograph by Jane Rix] .....</i>	<i>104</i>
<i>Figure 11: Simple tilings or tessellation - repeating patterns over an infinite surface [Permission from Wooden Books Ltd, Glastonbury, Somerset].....</i>	<i>126</i>
<i>Figure 12: Cross-section of Nautilus shell, illustrating symmetry and Fibonacci golden ratio [Photograph by Lorna Roberts] .....</i>	<i>127</i>
<i>Figure 13: Geometric figures, illustrating the shapes of sounds [Permission from Wooden Books Ltd, Glastonbury, Somerset].....</i>	<i>128</i>
<i>Figure 14: Water splash, illustrating symmetry breaking [Photograph by CK Foto] ....</i>	<i>132</i>
<i>Figure 15: 'Trilobe Synoptique', illustrating relationship between aesthetics, ecology and rhythmicity [Permission from The Pattern Book Company] .....</i>	<i>151</i>

# Chapter 1 – Introduction

## 1.1 Intentions

I have been involved in the practice of education for the past 40 years. In 2011, I retired from my full-time roles, the last of which was executive principal of two secondary schools with responsibility for the development of an arts education trust. That was a challenging position that tested my capacity, at that stage in my career, to the fullest extent. When I left that post and had time to reflect on the successes and failures of my tenure, I felt a momentum that inspired me to examine what I might consider to be, at the most fundamental level, the organic nature of the imperative of education.

Since then, through my current research, I have had the opportunity to rethink my experiences in education and to consider some of the current issues, dilemmas and paradoxes in that field. During this period, I have reflected on many years of practical experience in teaching and education leadership and, through an examination of relevant theory, suggested some answers to areas of consternation that have become increasingly apparent to me.

Two words and one image, for no obvious reason at that time, kept running through my head, while I was thinking about this thing that society calls education. The words were aesthetics and ecology, and the image was that of flowing water or a river. These phenomena were obviously very important to me and, therefore, if only for that reason, were worthy of dissection. And they seemed to reflect both the nature and the culture of what I had observed in those moments when I felt that education was something beautiful. These were sometimes fleeting moments, sometimes more prolonged, but they became the experiences that I have held onto during this period of reflection.

There are likely to be many popular definitions of the terms, aesthetics and ecology, and these definitions will vary, depending on the level of engagement of the speaker and, perhaps more significantly, their emotional attachment to each of the words. Each term has affective connotations, and each is used frequently in order to convey a depth of feeling and range of applications. The same might be argued for education, with which I have had a lifelong

engagement in a variety of ways. My intention in this thesis is to examine and elucidate the tangled, but productive, web that aesthetics, ecology and education might weave.

Perhaps this entanglement is apparent in the metaphor of the river. The paradox of the constancy of the flowing water is set against its ephemeral nature. New formations emerge only to be continually reformed in interaction with the other. The water is at times beautiful and at other times frightening – it can neither totally control nor be controlled – and it has a dynamic and rhythmic force, which affects all immersed in it. It possesses an aesthetic and an ecology.

I contend that this is also apparent in the education imperative.

## **1.2 Ecology and aesthetics**

Ecology is concerned with the connectivity between humans, non-humans and the material surroundings that they inhabit (Elton, 1927; Morton, 2010, 2012; Vellend, 2016). We, as a species, have a myriad of connections with our cultural fabric, such as schools, banks and shops; with theatres, museums and libraries; and with buildings, roads, towns and cities (Tuan, 1977). However, ecology is often used as a generalised term to convey nature and almost as the antithesis of the material fabric of our society (Morton, 2010). We talk glibly of ‘getting back to nature’ as if it is other, either in time, space or place. It conjures up beautiful landscapes, the sublime and the awesome, the separate and the distant (Thoreau, 1995/1854; Tilley, 1994). It highlights the divide between nature and culture, human and non-human, town and countryside (Ellen & Fukui, 1996). Yet how many of these dualities are separate and, if they are, does that contribute to the uncomfortable relationship we have with planet Earth, with each other and with the non-human other? Have rubbish tips, plastics and motorways become as much part of nature as hills, rivers and forests?

Aesthetics is an equally ambivalent term used to convey a variety of phenomena. It relates to the affective and the affected. It can be interpreted as pure art, as a subjective view of taste or as a sensitivity of being (Berleant,



1992, 2010; Cahn & Meskin, 2008). Often, the aesthetic refers to a way in which objects are experienced and interpreted, and this interpretation may be considered as disinterested. This implies that the interest in the object is so heightened that the subject becomes disengaged from other interests for that period, almost to the point of subject and object coalescing.

Because of my long-held interests in aesthetics and ecology, my thesis examines their meanings from different angles, particularly in relation to education. Aesthetics and ecology occupied my thinking for many years as a teacher, when I was considering the issues, paradoxes and complexities inherent in education environments (e.g. Garforth, 1966; Krishnamurti, 1975; Tagore & Elmhirst, 1961). However, neither one concept nor the other ever completely satisfied my curiosity about what it means to be educated. The nature of the process of education inevitably involves many dimensions at once, and to isolate one event from another seems disingenuous, if not anti-educational. Education, as opposed to just the process of schooling, is part of a complex web of activity (e.g. Bronfenbrenner, 1979), the unknowns of which are integrated into an essential dynamism, and which seem to generate their own energy in an autopoietic sense. It is the emergent nature of education that typifies this alongside its dynamic potential for transformation (Osberg & Biesta, 2008). The alternative typifies stasis, compliance and, at its worst, complacent stagnation.

### **1.3 Dynamic symbiosis**

My theoretical stance begins with an assumption, founded on the readings of, for example, Bateson (1972), Berleant (2000, 2010), Constantino & White (2010), Dewey (1925, 1934), Dufrenne (1973) and Ranciere (2004, 2009), that both aesthetics and ecology play a significant part in what we understand as education. I propose that aesthetics and ecology, while in themselves separate entities, exert greater influence when combined – when in a symbiotic and dynamic relationship (see e.g. Morton, 2009). Symbiosis exists in the relationship between two or more entities to their mutual benefit. Ecology and aesthetics bind us into both nature and culture, and this environmental awareness, on different levels, may be detected through multiple modalities – a

synaesthesia – each impinging on and overlapping with each other.

Synaesthesia is a condition in which there is a joining together, or fusion, of sensations that are usually experienced separately (Ward, 2008). Our environment, far from being just the subject of contemplation, collaborates in human perception and action (Berleant, 1991). This thesis amplifies and exemplifies these assertions through a number of interrelated themes.

Aesthetics and ecology exist as separate entities and have a significant modern cultural history. Aesthetics, deriving from the Greek *aisthesis* and pertaining to sensation or perception, came to prominence in the early 18th century through the work of writers such as Alexander Baumgarten (1735) and philosophers, Francis Hutcheson (1725) and David Hume (1757). Ecology is a more recent term first coined in 1866 by a German zoologist, Ernst Haeckel, in his treatise on 'The General Morphology of Organisms', and was developed further by biologists such as Charles Elton (1900–1991), Frederic Clements (1874–1945) and Eugene Odum (1913–2002).

Aesthetics and ecology, however, might be re-evaluated (see, for example, Bateson, 1972; Lovelock, 2000; Morton, 2009, 2010) within a posthumanist philosophical understanding of our current relationship with the planet (MacCormack & Gardner, 2018; Miles, 2014) and with those entities – human, non-human and material – with which we cohabit the planet (see e.g. Barad, 2007; Bennett, 2010; Bonnett, 2004; Braidotti, 2013). If seen as a symbiotic entity, mediated by a rhythmicity that inevitably provides a dynamism to the relationship, then a new conception of aesthetics-and-ecology might emerge, which may give us an insight into different ways of being and becoming. I propose that this may have interesting and important implications for the ways in which educators, researchers and society look at education.

## **1.4 Global and local challenges**

At every level, it seems that the concept of aestho-ecology that I have proposed may have a profound influence on the ways in which our societies have contributed to, and have to now exist with, the current changes and challenges that the human species faces. A climate crisis is already upon us, evidenced by

extreme weather patterns and increasing temperatures. Mass migration of peoples is a reality, bringing with it fear and misunderstandings. Our environment suffers health-threatening pollution. Species extinction is unprecedented and there is a breakdown in the normal order of our politics. Neo-liberal and anthropocentric behaviours are having catastrophic effects, which make the impending problems we face even greater. These challenges are strongly implicated in education as much as, if not more than, in any other categorisation of our day-to-day existence. They are world issues, and inevitably political issues, which need greater understanding at global, local and personal levels. I propose that these phenomena might be understood more fully through an informed awareness of the relationship between aesthetics and ecology, an aesthoecology, and acted on through an educational and transdisciplinary imperative.

## 1.5 The derivation of aesthoecology

This definition of aesthoecology was formulated relatively early in my research programme (2016), almost intuitively, and represented a template from which my work grew.

---

*Aesthoecology is the symbiotic and dynamic relationship between aesthetics and ecology, in which aesthetics represents the deep and often unconscious sensory awareness of being in the environment (our being in our environment), and the associated ecology, which represents a worldview as well as an intimate, unfolding and emergent understanding of the complexity, and immediacy, of our surroundings, which form our temporal landscape. Inherent in this, is the effect and affect that are predominant in the interaction between the two and the ways, often subtle, in which behaviours – actions, reactions – and consequences are elicited by the detection and emergence of individual and collective environmental changes.*

---

I felt that if I could theorise this statement and show that it has relevance to an education imperative I would be making a significant contribution to knowledge. If that theorisation and subsequent proposal were satisfied, they could play an important part in education scholarship and the anticipation of education

futures. We seem unable to face the reality of this precarious time and continue to see things as they have been seen. We hold on tightly to an education for a past that no longer exists (Amsler & Facer, 2017; Beare, 2001; Biesta, 2010; Facer, 2011).

In my study of the meanings of aesthetics and ecology, I challenge the conception of nature as it is commonly seen. I place it within a cultural context and claim that both nature and culture need to be seen differently (Descola, 2013; Morton, 2009; McCormack & Gardner, 2018). Aesthetics has a long history of being related to both nature and culture and has adopted meanings that have prolonged this dualism. Ecology has emerged as a scientific configuration of nature, arising from the Enlightenment, and subsequently has been used in a variety of ways.

## **1.6 Research approach and methodology**

I have been somewhat unconventional in the ways that I have approached this thesis. This is, in part, highly appropriate because of the stage in my life-course at which I have arrived, having spent over 40 years working in the environment of education. It is also appropriate because I believe that there is a case that education, and its underlying philosophy, should be approached unconventionally. In common with the development of my views on education, this theoretical research and the thesis that reports on it have not been a linear process. There is a trajectory, but it branches, and it spirals and it loops so that it sometimes appears to turn back on itself. This is not a piece of work that has absolute certainty; it is significantly speculative. I hope that it raises more questions than it answers, but it has purpose and that is to improve what we might understand by the experience of education. I hope that a clarity emerges that comes to resonate when significant matters of education are raised, and that others will take on some of the features of aesthoecology, to help to develop and transform education.

LeRoux (2017, p.198) suggests that autoethnography

*provides opportunities to help people interrogate and challenge aspects of their worlds and themselves in these worlds and to work towards reshaping these worlds – often in the interest of social justice.*

Muncey (2010, p.2) describes autoethnography as

*a research approach that privileges the individual ... an artistically constructed piece of prose, poetry, music or piece of art work that attempts to portray an individual experience in a way that evokes the imagination of the reader, viewer or listener.*

The autoethnographic approach that I have adopted and the process of thinking and writing are eloquently reflected in the metaphorical thoughts of Abram (2017, p.95):

*Writing, like human language, is engendered not only within the human community but between the human community and the animate landscape, born of the interplay and contact between the human community and the more-than-human world. The earthly terrain in which we find ourselves, and upon which we depend for all our nourishment, is shot through with suggestive scrawls and traces, from the sinuous calligraphy of rivers winding across the land, inscribing arroyos and canyons into the parched earth of the desert, to the black slash burned by lightning into the trunk of an old elm. The swooping flight of birds is a kind of cursive script written on the wind; it is this script that was studied by the ancient 'augurs', who could read therein the course of the future.*

My emphasis is more characterised by an evocative approach (Bochner & Ellis, 2016; Denzin, 2016), emotionally resonant and descriptive, than by the more analytic end of the autoethnographic spectrum represented by a 'realist, objective orientation' rooted in 'traditional symbolic interactionism' (LeRoux, 2017, p.198). My research is, however, underpinned by a theoretical demonstration of an intuitive, experientially informed view of aesthetics and ecology. I define these terms in some detail and explore them from a number of perspectives. I elaborate on these definitions because I propose that the overlap between aesthetics and ecology, through an intense relationship, has powerful influences on our view of education. Thus, is it possible to establish a new ontology based on this symbiotic relationship? This would add greater resonance to an understanding of education through aesthetics and ecology and which could be framed as an aesthoecological onto-epistemology.

The sequencing of the thesis has presented some interesting challenges. I had formulated some idea of aesthetics and ecology in combination, as aesthoecology, early in my research programme, as defined in Chapter 1.5. I apply this notion, later to be developed into an ontological concept, to further understandings of education prior to examining in detail the ways in which

aesthetics and ecology might exist as individual entities as well as how they might exist as a symbiotic entity. I recognise that the sequence could have been made more linear – starting with aesthetics and ecology, moving on to the notion of aesthoecology and then applying this notion to education contexts. However, as I started with the concept of aesthoecology, I decided on the order in which they now appear. Inevitably, I revisit issues, ideas and concepts in a non-linear manner, recognising the inter-connectivity that exists between them. Like a ball of string, whichever way you roll it up it is still a ball of string.

I discuss the way in which I have approached this research and the exploration of the literature in more detail in Chapter 3.

## **1.7 Thesis contents**

**Chapter 2** is pure autoethnography. I highlight aspects and phases of my life that have led to the writing of this thesis and the influences that have constructed my perspectives on the world(s) that I have encountered. I recognise the influences I may have brought to bear on those people and other animals, and the environments we have shared during my life and work so far. It is, therefore, a highly personalised account. Its informal structure, with limited referencing, counts as a starting point and as a compass point for that which follows.

In this way, I have painted the background to the perspectives I have taken, such that the reader can frame what follows within that context.

I go much further than that in subsequent chapters to draw on many other views, thoughts, analyses and critiques, in order to temper subjectivity with objectivity and to provide a balanced perspective that has validity and credibility.

**Chapter 3** is also based on autoethnography. I describe a return to scholarship in very different fields of endeavour from those in which I specialised before and develop encounters with the literature and discourse. I introduce the concepts of posthumanism and new materialism, which frame the arguments in the rest of the thesis.

In **Chapter 4**, I introduce the dualisms of subject and object, nature and culture. I discuss examples of education contexts, particularly museums and galleries, which in different ways might be seen to cross the divide and to provide spaces for the new and unexpected to emerge. I introduce the ideas of liminality and threshold moments to help visualise and conceptualise these creative spaces.

In **Chapter 5**, I discuss the history of the concepts of aesthetics and ecology, framing them as the affective and connected domains, respectively. A theme of education runs through this chapter. At this point in the thesis, the properties of aesthetics and ecology start to coalesce, such that an ecological relationship becomes apparent. I raise the importance of rhythmicity as a mediator between the two.

In **Chapter 6**, I identify aesthoecology as a developing concept and introduce symmetry and liminality as properties of the relationship between aesthetics and ecology. I do this by a further framing within posthumanism and new materialism and by elaborating on the importance of liminality and rhythmicity. This leads to affective anticipation as a critical notion within an aesthoecological perspective.

**Chapter 7** further develops the critical notion of affective anticipation. I explore what anticipation means in a normative education context and in a relationship which is symbiotic, emergent and affective. I illustrate this through my experiences in educational practice.

In, **Chapter 8**, the concluding section of the thesis, I stress the relationships between education and aesthoecology. The development of the theory, or ontology, of aesthoecology provides the foundations on which pedagogical approaches might be adopted. I have not seen that as the purpose of the thesis, but I do see it very much as the next stage. I discuss the potential that the theory of aesthoecology may have into the future and the differences that this may make. I follow the conclusion with a glossary of frequently used terms and brief definitions.

## **Chapter 2 – Setting the Scene: An Auto-ethnographic Perspective as an Introduction to the Research Study**

### **2.1 Introduction**

Throughout my career, I have felt, somatically and intellectually, that aspects of aesthetics, in the broadest sense, could be argued to be at the heart of the process of education. This may have been instinctive and subliminally inherent in the way I made decisions in my role in education. The study of aesthetics is fascinating, both culturally and philosophically, but it is the impact that an understanding of aesthetics has on education and education systems that has become my focus. In a later section of this chapter, I describe a transformational experience in an art museum, during which I recognised the relationship between subject and object substantially altering, and the two coalescing, which in some way made my return journey through the gallery a very different and profound educational experience. The power of my sensibilities and my appreciation of aesthetics changed the way I was interpreting my environment, and this formative, affective experience created a space within which I started to re-think the concept of education.

This led me into adopting an approach to education that is fundamentally aesthetic in its nature and qualities. I have come to consider that this aestheticism exhibits itself through symbiotic relationships, which act as a web, a mesh or a plasma that display ecological and dynamic characteristics. This belief in the power of my intuition has been significant throughout my career, but only now, through this period of theoretical and auto-ethnographic research, have I developed the vocabulary that allows me to articulate this position.

### **2.2 Early influences in natural history**

This aesthetic epiphany has arisen via a circuitous route. My early professional career was in the field of zoology, and I felt that I was essentially a zoologist from a very early age. It seemed to be part of what I was, and my early life was heavily influenced by an affective and intrinsic interest in and concern for the



natural world. This was not a cold and detached interest. I did not feel a sense of dualism between people and animals or between animals and their environment, and my interest was deeply somatic, involving a range of senses.

When I was growing up, I would spend hours looking at organisms in a pond or looking through binoculars at a garden bird. My father built me a shed in the garden in which I kept an array of diverse creatures. Some of them were domesticated animals, such as guinea pigs. Others were animals that had been orphaned or injured in the wild, and I adopted them. I reared a young starling, which slept with the guinea pigs, ushering them out of their sleeping quarters when it got dark, in order to take the warmest spot. I rescued a baby wood pigeon, which lived in the shed for weeks. When it was ready, I released it into the garden, where it remained semi-domesticated before one day flying off.

I was fascinated by a pair of Siberian chipmunks, which I had been given as a present and which lived in a large enclosure built as an annex to the shed. I spent many hours with a notebook observing their movements to see whether there was any pattern apparent. (This is particularly significant, considering the research I embarked on after my degree.) I kept buckets of water fleas near my bed in order to feed my sticklebacks, I hatched out mealworms in a tin box on our boiler and on one occasion I kept a scorpion, kindly donated by a friend's father who worked for a banana importer, in a glass jar on my bedroom window sill.

My parents were long suffering. My mother once said that a neighbour had telephoned to ask whether it was safe for them to put their baby out in a pram as they had seen my escaped rats in their garden. My rather wayward dog was seen chasing a woman on a bicycle down the road and taking a joint of meat out of her shopping basket. The whole family was sometimes seen with an array of nets chasing through the gardens trying to catch my chipmunks, which occasionally escaped.

In the spring, I regularly cycled to some local flooded gravel pits in order to watch the great crested grebe carrying out their mating display. It was at these gravel pits that, some years later as a zoology undergraduate, I undertook a research project on the seasonal variation of zooplankton. In local streams, I

caught sticklebacks in order to watch them in an aquarium as they built their nests, and the breeding male would aggressively threaten anything red, including a scarf that was next to the tank.

Extending my interests at a relatively early age, I became a member of the XYZ club (Exceptional Young Zoologists) at London Zoo, which allowed me access to talks by keepers and lectures on zoology by a wide range of speakers. Some vivid memories are of being shown behind the scenes in the animal enclosures and of being able to observe the animals at close range. I was close enough to them to feel that my full range of senses was engaged in relating with them. I cannot explain how excited I was. This was possibly when I first became aware of the significance of subject-object boundaries and of how cognisance may be enhanced by the melding of the two. It may also have been the first time that I became aware of some mild feelings of synaesthesia, in which a union, and some confusion, of the senses seemed to increase the overall perceptual experience. To look at the animal through glass was to separate and isolate, to minimise perceptual experience. But it was better than not seeing the animal at all. They were looking out and I was looking in; we were curious about each other in some way and in need of the next new experience. This type of need or curiosity is noted by Jonathan Miller, psychiatrist and director of theatre, in a BBC 4 radio programme, *Devout Sceptics*, in 2002:

*It's been found that monkeys ...will do things where the only reward is a further view of another room. If that's the only reward they will perform arduous tasks for the purpose of getting a better view of things. That seems to be the condition in which I find myself ... I am a monkey that is quite happy to get further views of what there is to be seen. And if someone offers me some more holes against which I can press my bloodshot eyeball I'll pay for admission.*

I can particularly remember attempting to communicate with primates through the glass barrier. I would raise my eyebrows while looking the monkey in the eyes. It would respond in similar fashion. I would scratch my head slowly and it would mimic me. It would run back to its group, and then a few more would follow back to the glass, curious to make sense of this strange primate on the other side. Then a few of my species would join me in their own curiosity. It was a surreal scene but, for me, highly poignant and deeply significant.

The observation made by Miller above, 'I am a monkey that is quite happy to get further views of what there is to be seen', reminds me of when I was a pupil at a primary school housed in a Victorian building, where the only windows were high on the wall, so we could not be distracted by the view. They were made of frosted glass, so even a view of the sky or distant treetops was obscured. For me, the early message was that formal and institutionalised education was kept separate from the natural world, that curiosity was unwelcome and that others would define what it was that I was to feel and learn. I was tested on it, and by it. I yearned to see, and be, outside. In contrast, in that situation, I really was not 'quite happy to get further views of what there is to be seen'. I wanted to be there and immerse myself in it. Even then, I felt there had to be much more to my formative years than what was being offered. Consequently, over subsequent years in school, I became quietly rebellious and possibly even personally damaged, and yet this may have perversely led to my spending my career in education.

My father had a great influence on the development of my interests. He shared my curiosity in natural history but from a somewhat different perspective. He was an artist, and his area of specialism was wood engraving and book design. The influence of the natural world was apparent in his work and he, in turn, was influenced by sculptors such as Henry Moore and Barbara Hepworth, designers such as William Morris, the art and architecture critic John Ruskin, wood engravers such as Thomas Bewick and Robert Gibbings, and the painter John James Audobon.



*Figure 1: Wood Engraving, 'Spring', by Os Turner, 1989*

Subsequently, I was inspired by natural historians such as Gilbert White and Gerald Durrell. I became particularly interested in the writings and artwork of the naturalist, Peter Scott. Apparently, a few days before Peter Scott's father died in his tent in the Antarctic in 1912, he wrote, 'Make the boy interested in Natural History. It is better than games. They encourage it at some schools' (Scott, 1961, p.7).

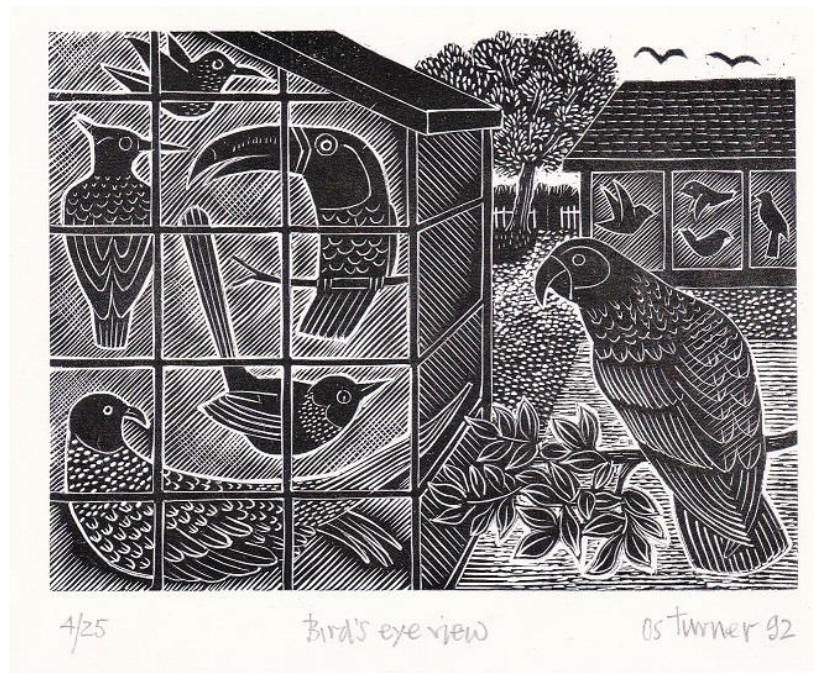


Figure 2: Wood Engraving, 'Bird's Eye View', by Os Turner, 1992

This view of natural history depicted through art had a significant bearing on my interest in aesthetics in the broadest definition of the word. It certainly influenced my ability to see the tiny detail, for example in a section of a woodland bank, and yet take in the enormity and complexity of a deciduous woodland. Within each, I could appreciate the interconnected nature of the organisms. I was able to detect the slightest movement in a hedgerow or a rustling in the grass, which would indicate the presence of a small animal and, as I became more experienced, I was able to predict an identification of the animal before I saw it. I remember a student once telling me that studying GCSE art did not improve her ability to draw or paint or sculpt but it allowed her to see the world in detail, and differently. That perceptual ability to see the detail, envision the whole and imagine the missing is a skill worth developing.



*Figure 3: 'Reclining Figure' by Henry Moore, 1979 [Photograph by Ron Ellis]*

I began to undergo a transformation at this point and, influenced by my father's views on art, I started to recognise that art can stretch the imagination from realistic perceptions to abstract perceptions and, in so doing, it allows varying interpretations of the world by involving different senses and imaginaries. What I see may differ from what you see, but it allows entry into dialogue, which may open up spaces in which the new appears.



*Figure 4: 'Draped, Seated Woman' by Henry Moore, 1957-58*



## 2.3 From natural history to science

Throughout my secondary school career, I chose the sciences because, in the grammar school I attended (1963–1970), there were no pathways for combining the arts and the sciences. You were one or the other. Given my interests throughout my childhood, it seemed inevitable that I would choose to study zoology further. However, it was a broad understanding of the subject that I needed, and my deeper interests were drawn towards ecological and behavioural studies, as opposed to biochemistry for example.

I began to understand my interest in biology through a sense of the aesthetic. It was bound up not only with my curiosity in the natural world but also its beauty. The more the study of biology became mechanistic, and understood through simple cause and effect, the less close I felt to it. This intuitive sense I had for biology was very much an anticipatory and affective experience, which I now recognise as having been a formative part of, and similar to, that which I later felt for education.

After graduating, I spent three years as a research assistant, pursuing postgraduate research in animal behaviour as part of a research group in London. I also taught one day a week on undergraduate biology courses and field ecology on residential field trips to the wilder parts of the UK. I was doing exactly the sort of work that I thought I wanted to be doing, but, somehow, I never felt comfortable in the location in central London. Of course, in many ways it was ideal for the sort of research that it was – an objective scientific investigation into daily rhythms of activity in house mice and their ability to adapt to varying light-dark regimes. It was broadly what I had started with my chipmunks in the garden shed, but now with much more sophisticated equipment and greater support and expertise to guide me.

However, undertaking this research in a small, dark, sensorily deprived laboratory on the fifth floor of a university building in the centre of London felt a long way from the naturalistic environments of sand dunes, woodlands, rock pools or lakesides that I envisaged would be my natural habitat, having studied zoology. The laboratory context reduced the environmental stimuli to, as far as possible, only those that were being tested. This was primarily the influence of

light, and the behaviours that were elicited were measured by the animals' locomotory activity. This reductionist methodology was interesting to me only up to a point. I could appreciate that if you reduce the input and measure only one output you can deduce that any effects are likely to be due to changes in the single stimulus. In that context, and in understanding the limitations of the experimental conditions, a simple cause and effect conclusion can be drawn.

Of course, I understood the importance of this empirical and positivistic research methodology, but the naturalist and the Romantic in me had to put it into a wider perspective. I had been influenced in my formative years by reading the works of Henry David Thoreau. In the introduction to a particular edition of his autobiographical epic, *Walden*, he expresses,

*As I sit at my window this summer afternoon, hawks are circling about my clearing; the tantivy of wild pigeons, flying by twos and threes athwart my view, or perching restless on the white-pine boughs behind my house, gives a voice to the air; a fishhawk dimples the glassy surface of the pond and brings up a fish; a mink steals out of the marsh before my door and seizes a frog by the shore; the sedge is bending under the weight of the reed birds flitting hither and thither ; and for the last half hour I have heard the rattle of railroad cars, now dying away and then reviving like the beat of a partridge, conveying travellers from Boston to the country.*

(Thoreau, 1995, pp.74-75)

I needed to take my research findings out of the laboratory and apply them to what I considered, ironically, to be the natural world. Closer to home, I spent time at London Zoo, where, at least, more natural surroundings were imitated. The Moonlight World, in the basement of the newly built Clore Pavilion, reversed day and night and was one of the first specialist nocturnal houses. Here, I compared notes with the keepers in that section. However, this still seemed artificial and so I needed to go further afield. This was, I realise now, more to satisfy my own needs than to further the efficacy of the research. At the time I convinced myself, and fortunately my supervisor, of the usefulness of these field trips.

I spent time in Thetford Forest, Norfolk, collecting species of mice to take back to the laboratory. I caught animals in live traps at different times throughout the course of 24 hours to make comparisons of activity. I set up moth traps, which had nothing to do with my research, purely out of interest. I watched deer from



the hides that were set up in the forest. I slept in a tent among the trees and immersed myself in the woodland habitat. I was perfectly happy. The scientific significance of my research faded as my imagination and sensory immersion took over.



*Figure 5: Wood mouse (Apodemus sylvaticus) [Photograph by Rudmer Zwerver]*

This was a purely aesthetic experience in an ecological context, which, unknown to me at that time, would guide my current theoretical research interests and my thinking in the interim. However, in some strange way, I felt that these feelings were wrong, that I was betraying my scientific education and that, somehow, this way of making sense of the world was perverse and unacademic. I was not up to the job of being a scientist. I was a fraud and unworthy.

My concern was that animals do not live in simple environments; they live in complex ecologies with vast numbers of stimuli, and varying dimensions, within which curiosity is both advantageous and risky. So do we. Relationships in those environments are both effective and affective; they rely on fast reflex response mechanisms and slower, cumulative behaviours. The inter- and intra-connectivity with other organisms, and with the non-living environment, is almost infinite and undoubtedly incredibly complex. Moreover, that organic and dynamic ecological condition seems to develop its own order from what could be considered as chaos. That order has a quality to it that might be considered

to be one of aestheticism, and it is arguably best understood through curiosity, imagination and creativity.

Consequently, and perhaps inadvisably, I took my research out of the laboratory and into woodlands, where it became very much more difficult to measure in a reliable scientific way the effect that any particular aspect of the environment had on any one organism, let alone within a community of organisms. I found myself relying very much more on my own relationship with that ecosystem, through observation and intuition, alongside more accurate objective measurement, in order to more fully understand animal activity. Both ways of understanding have their valid uses, but for me the affective understandings I drew from the fieldwork made me a far better naturalist, but not necessarily, in a strict sense of the word, a better scientist. I was immersing myself by using a range of senses rather than isolating myself and becoming merely an observer. I adopted an aesthetic approach to my curiosity. I became part of the natural system in an effort to get another, and another, new experience. Rather than choosing to isolate myself from what was happening, I recognised that being part of it was a profoundly affective experience. This embodiment of the environment felt deeply aesthetic.

## **2.4 A career in education**

My subsequent career move into secondary education still bewilders me. I believe it came about for a number of rather selfish reasons. I wanted a choice of where I might work and believed it would give me an opportunity to live in rural areas in the UK, or indeed anywhere in the world. I believed it would be a job that would provide time, during the long school holidays, to continue with biological research and to write up my PhD studies. I thought it might lead to posts in nature reserves, zoos, museums or field centres, all of which appealed to me more than the idea of teaching in schools.

Perhaps the most significant and the least selfish reason was that I thought I would be good at it. I had enjoyed the undergraduate teaching and I thought I had a natural aptitude for oratory and communication. I enjoyed the connectivity it provided. It also seemed like a career that would be ethical and worthwhile.

While some of these reasons proved to be the case, I was soon disabused of any idea that I would have surplus time or energy to pursue further biological research, let alone write up my PhD.

Nevertheless, I applied for a place on the post-graduate certificate in education (PGCE) at the Institute of Education, London, where I qualified in 1978. I specialised in biology education, with a view to teaching in secondary schools, at least initially. I enjoyed the course far more than I thought I would. I remember that in the first lecture of the autumn term we watched the film, *Kes*, in which a 15-year-old, disaffected working-class boy is transformed in his attitude to education by his relationship with a kestrel. The power and influence of the film resonated with me. I realised that I was likely to be encountering a culture of education that was very different from my own, and yet I could empathise with the feelings and actions of the boy in the film. This realisation, when I started teaching, influenced my working life in more ways than, at that stage, I could ever have imagined. For the first time, I felt political in my thoughts and actions. The opportunity to influence change was an important motive and worthy of pursuit.

I followed the PGCE course with vigour and enthusiasm. I was one of the first of our cohort to be interviewed for jobs and I remember my confidence being boosted, in ways that I had not really experienced before, by positive comments made by my tutors and fellow students. I realised how important it was to feel confident and fulfilled by the work that we undertake. I was one of the first of the students to obtain a teaching post. It was in an 11–18 secondary school in Devon, ‘midway between the moor and the sea’, as the advertisement seductively pointed out. My immediate aspirations were being fulfilled. The school had a very large sixth form, and most of my teaching would be with sixth-form students.

I was also, however, teaching younger students in what would now be years 8 and 9 (12- to 14-year olds). These were mixed-ability classes of students from a range of backgrounds. I soon realised that, unlike the undergraduates I had encountered previously, and my current A-level students, biology was not necessarily of great importance to them. In fact, school was something for many of them that was to be endured. An added complication were the social issues,

not as major as in more urban areas, but nevertheless surprisingly significant. I became increasingly interested in the notions of education relevance, holism and sustainability. I tried to place myself in the position of young people who had so much difficulty in their own lives and families, trying to motivate themselves to the regime and values of traditional schooling. It was difficult to reconcile their two worlds.

I started to wonder whether biology, which I believed to be extremely important, was going to be motivating for them as a starting point, or whether social and personal issues in themselves might lead into the study of biology. At this stage, my questions were primarily pragmatic, but similar pedagogical issues stayed with me for many years and guided my practices in schools.

Even at this early stage in my career, I questioned the existing curriculum and how it might be more appropriately organised to engage students in a holistic way. I was questioning of myself and of what I considered to be the important temporal, spatial and ethical dimensions of this organisation called 'school'. I talked to teachers of art, drama and dance, and I began to incorporate their methodologies into science teaching in order to help students understand biological concepts. I encouraged students to walk around classrooms and laboratories, or fields and playgrounds, to pretend to be molecules of oxygen entering the lungs. I suggested they might choreograph a dance that illustrated DNA, the building blocks of life, and the way in which cells divide through mitosis and meiosis. I persuaded teachers of arts subjects to team-teach with me so that collaborative teaching might be developed. Curiosity, creativity and imagination, it seemed to me, are essential to all subject teaching, and the understanding of the subject is enhanced through symbiotic methodologies. In this way, I started to see how students could take control of their own learning and how it could become embodied. They could turn essentially passive classrooms into dynamic learning spaces.

These teaching methods had mixed responses, to say the least, from those of other teachers, but I was, in a small way, being innovative, and at that time there was space to be experimental and to take risks. There was, of course, a need to ensure that students passed examinations and were prepared and qualified to move on to their next stage of education, but this did not dominate in

the way that it does now. There seemed to be so many barriers to coherent learning practices, which included separation between subjects, the classroom walls, the divisions of year groups, the setting arrangements of students, daily timetables and the separation between the school and its community. I wanted to see what would happen if we started to break these barriers down and dared to do things differently.

After a relatively short time in post, primarily because of staffing circumstances, I was promoted to become head of biology. I was interested in taking more responsibility for younger students in the formative stages of their education and sharing the A-level teaching among colleagues. This gave greater opportunity to develop innovation in order to broaden the appeal and relevance of biology. I enjoyed the design of the curriculum and being in a position to influence the way in which things might be done. I promoted some very unusual ways of structuring the teaching. However, most of all, I realised the inertia there is in individuals and organisations. For me, the status quo was not an option because teaching is a dynamic and ever-changing landscape. For others, the idea of change was unsettling, and the energy put into resisting change was more important. This recognition of the organic tension between dynamism and resistance, doing the right thing or doing things right, and action and reaction, was to stay with me throughout my career and has influenced the direction of my research in ways that I could never have foreseen.

I was eager to learn more through taking on different roles. I spent time as a head of year, as a deputy head with pastoral responsibilities and then, in a different school, as senior deputy head with curriculum and community responsibilities. I recognised that these distinctions between roles were arbitrary and overlapping but were important to me to develop coherence in my thinking about education. I became particularly interested in community education and took on responsibility for youth work and adult education, which, in my view, played an important part in breaking down the barriers between the artificial and clichéd dualisms of, for example, pastoral/curriculum, school/community and academic/vocational. This provided the nexus and the connectivity that later became even more important in my thinking.

When I started this stage of my career in secondary schools, I was not ambitious. However, I found myself, for a variety of reasons, given the opportunity to take on roles that meant that I could contribute to, influence and (even) direct changes that, in my judgement, would make education provision better for young people and the local community. It was with that in mind that I applied for, and was appointed to, the position of principal of a secondary school that was also a community college. I was 36 years old and relatively young for this post. I, through the governors, was now responsible not only for the 650 students in the school, but for the specialist provision for youth work and adult education. This was the sort of post that I particularly wanted and within which I had the opportunity to build the type of education that could provide opportunities for the whole community.

Over the next 20 years, I developed the college, both in the way that I felt was philosophically appropriate, as far as was possible, and the way in which it was evaluated through the Office for Standards in Education (Ofsted). It grew to be a large community college of 1250 students, which over the years required a substantial building programme. It incorporated a community sports centre, a purpose-built youth centre, an adult education centre and specialist arts facilities. It became a community campus and was integral in many ways to the environment within which it was sited.

However, I became increasingly frustrated with the stranglehold imposed by the limiting demands for standards, measurement and evaluation. Progressively, I felt that I was becoming a mere political functionary, a feeling that limited innovation and risk taking. I had been influenced and guided by examples of education provision that to me seemed appropriate to the value systems that I was adopting – equality of opportunity, elimination of barriers to access and resources, and teaching and learning geared to the individual rather than the system. I was eager to develop another learning campus that reached beyond its boundaries and was reflective of the community and open to emergent change. My final full-time education post as the executive principal of two secondary schools in Bournemouth (2009–2011) was also centred on this type of development.

I had learned much from local authority community education systems in Leicestershire, Cambridgeshire and, latterly, parts of Devon, during the 1970s and 1980s. Some independent schools, founded on particular philosophies, also influenced my thinking, such as Dartington School, Devon and schools based on the thinking of Rudolf Steiner and Krishnamurti, for example. I was particularly interested in the practice of local special schools and pupil referral units (PRUs), which often successfully adapted their curriculum to cater for individual needs.

I began to think of the ways in which schools operate in biological terms. This suggests that there is an organic nature to them and that they display autopoietic characteristics. They are undoubtedly complex in their nature, and while we treat them as simple systems, there is always the element of the unknown. They always seem beyond our total control, subject to new situations that will surprisingly emerge and will have to be dealt with. Good management is deemed to eliminate surprise and yet those new, unexpected situations are often those that drive change and open spaces for new thinking.

The most detailed plans must be altered on a frequent basis, or unexpected events will need to be explained away. I considered that there might always be a limiting factor, just as there is in photosynthesis. Consequently, when things are not progressing as expected, there will always be at least one element that requires change. I had thought that schools operate as a homeostatic system, in which detected deviations from the norm are rectified to bring them back on course.

Managing a school is littered with paradox, but, in my experience, it is seen as a sign of weakness if we are not demonstrably in control of the paradox. Similar dilemmas are seen in contemporary political and environmental scenarios, where the control of nature and of people has been accepted as a sign of civilisation. It is now important to recognise that the time has come for a period of working with as opposed to taking control of.

During my time in school leadership, I was fortunate to work with a range of very talented colleagues within and outside of schools. I had extensive involvement with government initiatives such as the 'Every Child Matters'

agenda (2003) and the extended schools programme (2006) and I was invited to contribute to organisations such as the National College for School Leadership (NCSL) and the Specialist Schools and Academies Trust (SSAT). These experiences provided opportunities for involvement at government levels in the development of policy. I attended meetings in the House of Commons, the House of Lords and Number 10 Downing Street. I had an insight into the excitement and mechanism of policy development, alongside the inevitable hypocrisy required to demonstrate success through target setting and the ever-tightening band of accountability, the extremes of which I believe choke originality and creativity.

Consequently, I valued even more the types of curriculum initiative that I observed in my time as a college principal. I was able to witness teachers and other staff working in very exploratory and innovative ways. This approach embraced risk and trust in their ways of engaging with students with the expectation that this would enable greater understanding of pedagogy, student engagement and learner confidence.

## **2.5 Particular examples of curriculum initiatives**

The examples below illustrate this wider and connected perspective of education. This is the notion of schools, or colleges, embedded within their community founded on the belief of connectivity at all levels – individual, family and community (see e.g. Bronfenbrenner, 1979). The college (specifically in these examples a community college) in this context is in functional relationship with other groups, organisations and affiliations, thus working within the philosophy of ‘a learning campus’ or ‘a school without walls’ (see e.g. Partridge & Bath, 2019). This illustrates a particular philosophy of education that I progressively began to recognise as being based on understandings of, and relationships between, aesthetics and ecology, which encouraged the idea that much of what was learnt emerged as opposed to being pre-defined.

This educational imperative appeared to be embedded within an assemblage of cross-disciplinary work, the centrality of inclusion, the recognition and development of support networks and the student and teacher as an integral part of a complex web of activity. Below are examples of educational projects



that developed from the inspired ideas and passion of teachers who took the lead on these initiatives. It was important from my perspective that the college's leadership teams encouraged and supported these types of initiative to allow experimentation and the emergence of new pedagogical solutions to inspire learning and teaching.

These initiatives were not linked to the establishment of definitive outcomes or milestones decided beforehand, although these were often required for external funding applications. If the ideas seemed to be workable as they arose from intuitive and informed debate, involving students and staff, then they would be supported.

I have, therefore, selected three projects to illustrate the ways in which greater understandings of aesthetics and ecology help a further understanding of the practice of education.

**Lunch club** – The lunch club was a community curriculum activity. It met on a weekly basis during term time and provided a three-course lunch. It was highly valued by the participants, and there was a regular membership of about 20, mainly made up of senior citizens. The club met either in the college youth club or in the food technology suite, which had space for community activities. It was advertised in the college's community education programme and was open to everyone who wished to attend.

The integrated nature of the activity became much more important than the individual subject areas that contributed to it. The idea was promoted by a number of community-oriented staff who taught food technology and who also contributed to the teaching of personal, social and health education [PSHE]. This included a curriculum focus on citizenship and health education programmes.

The event was organised by a group of secondary students (12–15 year olds), a different class group of whom was timetabled each week. This allowed for as many students as possible to experience and benefit from the event over the course of an academic year. While the main subject areas involved were food technology, PSHE and citizenship, in practice, the experiences were of a transdisciplinary nature, considered to be of value as affective experiences

within a framework of sharing, discussing, socialising and reflecting. The outcomes of the experience may have included different affects and effects for each of the participants, and this aspect was an important focus for discussion afterwards.

The students, with the support of their teachers, were responsible for planning the lunches, deciding the menu, greeting and socialising with the guests, cooking and serving the food, clearing and washing up and providing entertainment. The entertainment might be a visiting speaker or an arts event, such as dance or music, performed by the students. Different tasks would be allocated according to interest, and they would work together as a team.

The atmosphere was very informal, and the experience was appropriate for all students whatever their ability or aptitude. It helped in developing relationships between people of all ages, it was experiential and it was active. The different experiences would be discussed after the event, with the help of the teachers, and collectively new understandings would emerge.

**Centre for students with autism spectrum disorder** – The college, as part of its special educational needs provision, was frequently asked to accept students who had been diagnosed as being on the autism spectrum. This was, in great part, because the college had a very good reputation for its special needs provision and inspirational staff who worked in that area. Through this, an expertise was developed further within the wider college staff to enhance awareness of the characteristics of autism spectrum disorder [ASD].

Understanding ASD was recognised not just to be valuable for supporting those students and their families, but other students as well. To become familiar with students who display specific challenges had the potential to develop empathic and caring attitudes within the college community as a whole and a greater understanding of those who showed differences in behaviour, some of it particularly challenging.

Because of the growth of this expertise, the college was asked by the local education authority to consider hosting a special provision for those secondary-aged children within the college with ASD. This provision would accept students on the autism spectrum, develop expertise for other schools who may encounter children with these characteristics and provide a resource for the

community at large. This proposal fitted closely with the philosophy of the college as tolerant, inclusive and experimental in its curriculum, pedagogy and relationships. Jordan and Powell (1995, p.165), referring to children with ASD, suggest that individuals 'have the right to have their interests recognised and respected by the curriculum, which cannot therefore rest solely on predetermined and common experiences and goals.' This approach would apply equally to all in planning for inclusion across the college.

The local education authority offered capital monies to provide a new building on the campus. Some might have argued that this should be a separate and independent building. However, the staff leading the venture were very keen that the provision should be at the centre of the college to illustrate the case that student support and care for individuals, and their similarities and differences, was central to the college ethos. It was consequently located centrally, as an annexe to the learning resource centre, but with its own entrances and quiet areas for students who required their own space.

My perception of the influence of this provision was that it exemplified a philosophy of care, concern and responsibility that radiated out to the ways in which relationships were developed in all other areas of the college. It influenced a view of education that went way beyond normative standards of assessment and effectivity and exemplified for me the complexity and value of holistic community provision.

**Art gallery** – The building of an art gallery as an integral part of the college's work emanated from a successful application for specialist visual arts college status in 2002. The development of the specialist schools programme nationally (Education Reform Act, 1988; The School Standards and Framework Act, 1998) included technology, the arts and sport early on but it was not until 2001 that the government's white paper (Schools Achieving Success) encouraged expansion of the programme to include a wide range of other subjects.

The arts had been significant within the educational programme of the college for some years but perhaps no more so than a number of other areas of the curriculum that might also have laid claim to specialist status. There followed an interesting and informed discussion within the college about which area to specialise in, and why. The argument for the arts was the most compelling, in

part because the proposal was very experimental and innovative. A successful application for visual arts college status was made in 2001/2002.

One of the most exciting developments that sprang from this designation was the proposal that a building in need of refurbishment should be adapted to form a range of specialist visual arts studios for teaching purposes. However, further to that, and particularly innovative, was the idea of building a community art gallery as an extension to the refurbished visual arts centre. This would be an open area and would not have regular timetabled classes in it. It would be open for use by all curriculum areas and the community during the day and evening. It was envisaged, for example, that science might display biological exhibits, that modern foreign languages [MFL] and humanities might display artwork distinctive of international culture, or that geography could use it for a photographic exhibition from a recent field course. This would have curriculum benefits during the day, and invitations would be issued to members of the community to see the exhibits in the evening. The area would be a stimulus for encouraging display and exhibition in other areas of the college and for drawing attention to the aesthetic and connectedness of our surroundings and the materials and structures therein.

The fact that the gallery was an area that enthusiastically encouraged cross-curricular work and community involvement, including that of local primary schools, led to others developing interesting and innovative ideas and entering into networks of a variety of disciplines and interests.

## **2.6 Personal experiences influencing an interest in aesthetics**

Following my semi-retirement from full-time education posts, I had the opportunity to travel and to think. I needed that space to evaluate my thoughts on my career and the whole notion of education. It was a cathartic period, which allowed me to step back from intensive immersion in performing as a college principal, and through reading, thinking, writing and observing I was able to muse my way through the education landscape. Particular experiences galvanised my thoughts, the first of which was when staying in Venice for three months in early 2012.

The Fortuny Museum, Venice, is housed in the Palazzo Pesaro degli Orfei, an eccentric museum full of artistic, cultural and historic surprises. The Palazzo is situated in San Beneto and was built in the mid-15th century, although the building that stands now shows signs of a lengthy process of change and adaptation. It is apparently one of the finest examples of the late florid Gothic style, described as monumental yet elegant in Franzini et al. (2011). The building was much admired by John Ruskin, the 19th-century art critic, who recognised in it a masculine yet also soft and delicate character. A guidebook describes the Palazzo as being of Venetian Gothic style and of exceptional quality. (Franzini et al., 2011).



*Figure 6: Facade of a merchant house, illustrating Venetian Gothic architecture [Photograph by Natalia Bratslavsky]*

From my perspective, it is a rambling old building and, as with almost all Venetian palaces, the first-floor salon or *portego* I was in would have represented one of the main living spaces. It is effectively a gallery, rectangular in shape, and some 140 feet long. The artist, Mariano Fortuny, transformed this

space into a workshop for experimentation, production and public exhibition of photographs, fabrics, stage designs and furnishings. Off one side of the gallery, is a picturesque, partially enclosed outdoor staircase that leads up from a tiny courtyard, characteristic of almost every Venetian palazzo. The gallery itself is littered with easels, library ladders, reading desks, oriental table lamps and projectors. The first half of the gallery has walls lined with Fortuny's fabrics and paintings, but at the other end it becomes progressively sparse, even unkempt and comparatively barren. Fortuny died in 1959, but it feels as if he is still living and working there.

I meandered through much of the length of the gallery, admiring the modern and original series of portraits lining the walls, before taking a detour into a smaller wing off the portego, which displays copies of works by Tiepolo, Titian, Veronese and Tintoretto. This is the painting studio adorned by a vast, trompe-l'oeil decoration, giving the deceptive impression of the room being overhung with luxurious flowers and fruits. As I walked back into the main gallery, I was struck by how the walls now seemed so mundane in comparison and I found myself in front of a blank wall, which starkly indicates that this is the end of the gallery. To the right, was an open door. I was convinced that it was a cleaner's cupboard. It was characterised by the blackness of the interior.

For some reason, curiosity drew me in, but I was rather fearful that this was a space not meant for visitors. I was about to turn and go out, but then saw that on the right was another room, on the furthest wall of which was a very bright red rectangle that, as I looked in from the darkness, was warming and welcoming but so unexpected. I lost my bearings, my senses were confused and I was perplexed as to why this rectangle was there. Slowly the red started to change. It started to get darker and then slowly turn to blue. It was difficult to know whether it was changing colour or whether this was a process of sensory adaptation. The colours changed again, this time to a very subtle green, which drew me further into the room. Because of the juxtaposition of the darkness of the room and the colour on the wall, the experience was surreal and disorientating. My curiosity had been heightened.

I could not leave the room without finding out more. I walked towards the wall and put my hand out. My eyes might have been deceiving me, so I needed to

use other senses to explore further. I was trying desperately to make sense of this situation while simultaneously enjoying the excitement and sensation of being there. Perhaps making sense and enjoyment are symbiotically compatible. My sense of time and space was being challenged. I did not know how long I had been there, and it did not matter.

Reaching out to touch the wall, or just the colour, was revealing. There was no wall there – or not where I expected it to be. My hand could reach inside the colour, reach beyond the wall. It was not until I also put my head beyond the ‘wall’ that I realised the deception that I had been drawn into and found an explanation for these sensations. This felt like a new type of educational experience, one in which the rules were removed, and I was free to feel and act as I chose.

What was revealing, on reflection, was the experience of the darkened room after that of the gallery. There, the artefacts were displayed in a relatively conventional manner and were concerned with the world of the arts, and they worked collectively to affect me. They put me in an educational space, which did not dictate how I should think but merely provided me with a new space within which to think. The artefacts are creations; they are one person’s depiction of the world and on display to stand on their own as art within an architectural context which, in itself, is art. The palazzo and its contents, however, are inextricably bound up with the life of the artist, Mariano Fortuny, who recognised that his works meant nothing if they were not available for others to interact with in their own individual ways and by bringing their own cultural background to them.

But does it matter which is the object and which the subject? My understanding of being in the gallery was that I was the subject and that which had been created before me, which I was receiving as the work of others, was very much the object. The objects were out there, framed, for me to make sense of or to sensorially assimilate. But in the context of the darkened room this relationship changed, such that subject and object combined in some sort of symbiotic way, making my return journey through the gallery a very different experience. This started to transfigure the way I thought of education and, consequently, a journey into a new theory and significance of education began to take shape.

Further experiences reinforced my curiosity and enquiry into the aesthetic and heightened my fascination with people's behavioural responses in galleries. In 2015, while in Tasmania, I visited the Museum of Modern Art in Hobart. This gallery was constructed by drilling vertically down through the depth of four storeys into a cliff. A lift takes visitors to the bottom floor and then, by way of a long, spiralled walkway, the journey is upwards towards ground level. The environment of the gallery is as significant as the artefacts and installations. We were in a cave, where the external walls show the stratification of the rock face. There is no natural light, so the atmosphere is created by artificial lighting. The internal walls of the gallery allow for the display of works of art that are small or, indeed, as some were then, two to three storeys high. From the curator's point of view, this gives several advantages and perspectives for displaying and viewing the works of art. The experience inspired me to re-think education. It raised a number of significant questions, which I have subsequently attempted to relate to education contexts. For example, the first instalments that inspired me could be seen from different angles and elevations. It was like the spraying apparatus in an automatic car wash. A long beam of metal was suspended some 10 metres in the air, and water squirted from it at high pressure at approximately two-second intervals. With each spray, a word appeared for a fraction of a second. Each word was contemporaneous with a news item or world event. It appeared and disappeared so quickly that it just sparked an idea, an image, a feeling almost as if it were in the sub-conscious, a fleeting thought.

These examples of museum experiences provided a hinterland from which I was able to progress from an immersion in the practice of education towards a new way of understanding it outside the received norm and unencumbered by the expectations of acquired Euro-Western culture. To pursue research that followed this stream of thought seemed an obvious next step, but appropriately I had no idea where this would lead me.

## **2.7 Summary**

I now recognise these intuitive experiences as affective experiences, which I am more effectively able to understand and articulate, finding a vocabulary that incorporates and encapsulates the aesthetic domain. Thus, when art in the



museums and galleries that I visited presented itself as interpretation or evaluation, it played on appearances and my emotional reactions. The idea that illusion as I experienced it turns out to be truer than any other activity even intellectual activity (Ferry, 1993) was a helpful starting point and was further elaborated in examining my response to art as ‘cosmic in its resonance and hence posthuman by structure, as it carries us to the limits of what our embodied selves can do or endure’ (Braidotti, 2013, p.107).

Seeking truth in illusion may be one way of describing curiosity and an important pre-requisite for an enquiring mind. Illusion, curiosity and enquiry I consider to be important aspects of education, each of which might be described as starting with, and continually returning to, the aesthetic domain. It is with this in mind that I embarked on doctoral research. I do so within a new framework of anticipatory affect as opposed to the accepted and dominant ways of cause and effect.

I, therefore, inevitably bring a particularly auto-ethnographic perspective to my current research, and I shall extensively draw on that during the chapters that follow. My early influences and interests were predominantly concerned with the natural world, which I now interpret as affective ecology. Following 35 years in formal education systems, I have progressively, and now extensively, questioned the positivistic way in which education is viewed and pursued. Now I have an opportunity to adjust the prism and, as if through a kaleidoscope, to look at the issues from different perspectives. Through more recent experiences in museums and galleries, I have developed a new sensitivity to the understanding of education. I have been curious to pursue this further through research, for which one of the key motives might be described by this extract:

*One of the most enchanting toys is that beautiful thing in the National Gallery, called the Hoogstraten’s Box, which has a little eyehole into which you look at a painted trompe-l’oeuil Dutch interior. Now you can’t actually, from any one particular view point, see the whole of the room but it is so intriguing to be able to see anything of the room that you will keep your eye pressed to that hole because it is more interesting than keeping your eyes shut.*

(Miller, 2002)

It is with this sense of curiosity and enchantment that I want to see more so that I may, in collaboration with others, understand the past, experience the future and open the range of possibilities that may be encountered on this research journey.

# Chapter 3 – The Theoretical Research Framework in the Context of Posthumanism and New Materialism

*The highest education is that which does not merely give us information but makes our life in harmony with all existence.*

(Tagore, 1861–1941)

## 3.1 Introduction

The methodological nature of my research is autoethnographic and theoretical because I feel that, having spent 40 years in specific education contexts, I have sufficient material with which to theorise my experiences. I did not want to explore one specific issue in teaching or learning, and my research, therefore, has been a holistic and expansive exercise, which more fully recognised affectivity and futures thinking than the current UK discourse of efficiency, effectiveness and accountability.

## 3.2 Evidence-based practice

I was, and still am, sceptical of ‘evidence-based practice’ (see, for example, Biesta, 2010; Davies, 1999; Evidence Based Teachers Network, 2017; Fox, 2003; Hammersley, 2007; Nelson & Campbell, 2017; Thomas & Pring, 2004) as the sole way forward in diagnosing and solving problems of teaching and learning. This seems to adopt linear and narrow pathways to the learning process and is very often a piecemeal approach, what Bateson (2016, p.19), in a different context, calls ‘mono-cropping’. This is counter to the approaches I have adopted to the understanding and practice of education. Hargreaves (2007, p.5), for example, expresses concern that

*Much educational research is ... non-cumulative, in part because few researchers seek to create a body of knowledge which is then tested, extended or replaced in some systematic way. A few small scale investigations of an issue which are never followed up inevitably produce inconclusive and contestable findings of little practical relevance. Replications, which are more necessary in the social than the natural*

*sciences because of the importance of contextual and cultural variations, are astonishingly rare.*

This situation in educational research is contrasted in the same section with research in medicine which Hargreaves claims,

*has a broadly cumulative character. Research projects seek explicitly to build on earlier research – by confirming or falsifying it, by extending or refining it, by replacing it with better evidence or theory, and so on.*

(ibid)

I admit to having some sympathy with these arguments within certain education contexts, but a small- or even medium-scale research project in a pre-defined area was not going to satisfy my much more fundamental concerns. The reliance on cause and effect analysis and efficacious intervention strategies is to a certain degree countered by Hammersley's response to Hargreaves:

*The problems relating to the establishment of causal patterns are equally severe. Since we are interested in what goes on in real schools and colleges, and because strict experimentation is often ruled out for practical or ethical reasons, this task becomes extremely difficult. How are we to control competing factors in such a way as to assess the relative contribution of each one in what is usually a complex web of relationships? More than this, can we assume that causation in this field involved fixed, universal relationships, rather than local, context-sensitive patterns in which interpretation and decision on the part of teachers and students play an important role? Unlike in most areas of medicine, in education the 'treatments' consist of symbolic interaction, with all the scope for multiple interpretations and responses which that implies. What kind of causal relations are involved here, if they are causal at all? And what kind of knowledge can we have of them?*

(Hammersley, 2007a, p.23)

This suggests that education and medicine are different processes and often, therefore, may require different research approaches. Both disciplines are complicated but from a different perspective. This resonates with the concerns I had during my period of quantitative biological research and, later, in education. So, partly for these reasons, and also because I wanted to indulge myself in my own journey of exploration, based on tackling the normative conventions of education experienced as a child, as a teacher and as an educational leader, I have chosen to examine education from a biological and holistic perspective, seeing it as a web of activity.

### 3.3 Autoethnography as methodology and consideration of researcher positionality

I believe there are considerable advantages to autoethnographic research at the end of a more formal career in education. Pursuing doctoral studies at the culmination of a career can provide interesting and informed insights. Muncey (2010, p.20) echoes this sentiment:

*A craving to be included in the academic community culminated in a doctoral study that paradoxically marked the end of my need to conform. All of my discomfort with received wisdom is finding solace in answers from outside mainstream evidence. The paradigm shift that I feel is occurring in the world is reflected in the shift in my own views to find solutions outside conventional approaches.*

The research programme became a unique exploration and an opportunity for breaking new ground. I had always been encouraged to be 'a reflective practitioner' (Roffey-Barentsen & Malthouse, 2013; Schön, 1983), but I was now able to step into a new space in which the aesthetics, and correspondingly my sensitivity, began to change. Ideas were now free to twist and turn around each other as I began to recognise the vital materiality (Bennett, 2010) of the educational condition. However, as I read more, I realised the sensitivity of the position of the researcher, particularly in autoethnography, and the consequent paradoxes that arise. I chose to start the research study, and therefore this thesis, from a biographical point of view. I was starting with my own story and experiences and from that was expecting to broaden my experiential understandings into theoretical and philosophical realms. If these understandings were to be of value more widely, I needed to explore a methodology that would serve to provide insights into, and inspire change within, a world of education of the future. Exploring the views and opinions of writers in autoethnography (e.g. Bochner & Ellis, 2016; Denzin, 2014, 2016; Holman Jones et al., 2016; Marak, 2015; Sikes, 2013) I have noted the advantages and disadvantages of this approach and, in particular, the idea of transforming the autoethnography 'into a critical, performative practice, a practice that begins with the biography of the writer, and moves outward to culture, discourse, history and ideology' (Denzin, 2016, p.124).

Interpretive autoethnography, particularly at the evocative end of the spectrum, seemed to be valuable in this respect because it is based on an individual's life story, which, according to Denzin (2014, p.7), represents 'conventionalized, narrative expressions of life experiences'. Further, Ellis (2009, p.13) claims,

*As an autoethnographer, I am both the author and focus of the story, the one who tells and the one who experiences, the observer and the observed....I am the person at the intersection of the personal and the cultural, thinking and observing as an ethnographer and writing and describing as a storyteller.*

(From: Denzin, 2014, p.19)

In this way, the research is based on an autobiographical genre of writing and research that displays multiple layers of consciousness, connecting the personal to the cultural. In doing so, it accepts the evocation of personal feelings – the emotive or affective side of story-telling and life drama – known as evocative autoethnography. (e.g. see Bochner & Ellis, 2016; Denzin, 2016). Denzin suggests that experiences have effects at two levels: a surface level in which the effects are unremarkable and a deeper level at which it cuts to the inner core of a person's life – an epiphany. In talking of the structure of epiphanies, Denzin (2016, p.131) draws on theories of liminality, in which the autoethnographer gravitates to those 'narratively structured, liminal, existential spaces in the culture' (ibid). Denzin asserts that in these spaces there are dramas that exhibit 'complex temporal rhythms' and 'multiple and differing forms and layers of meaningful experience' (ibid). This resonates with the substance of my thesis and guides the way in which I became entangled in the theory and philosophy of my areas of interest.

Having gained a lot of experience in education over many years, I wanted to use those experiences in order to try to understand education better and to try to make greater sense of it, based on the intuitive sense of the importance of aesthetics and ecology. However, what is apparent is that, in a body of research based on autobiography, care needs to be taken to recognise the considerable bias that is inevitably present. I am only able to see and interpret situations from my own cultural standpoint. As Barad (2007, p.85) suggests, 'Practices of knowing and being are not isolable; they are mutually implicated. We don't obtain knowledge by standing outside the world – we know because we are of

the world.’ It is, therefore, important to consider dispensing with ‘the privileged position of human separability and the fantasy of distance it installs’(Taylor, 2016, p.15). Consequently, Barad (2007, p.394) observes that ‘Responsibility entails an ongoing responsiveness to the entanglements of self and other, here and there, now and then’ (In Taylor, 2016, p.15).

The advantage I saw in an autoethnographic approach was that it offered rich qualitative data from long-term involvement in educational practice and a recognition of interaction between self, experience and all other actants – human and other-than-human. However, this is very personalised data and, therefore, awareness of its limitations is required, particularly those of an ethical nature. Any perception that an autoethnographic approach could be seen as self-indulgent, introspective or individualised needs to be addressed.

Hultmann and Lenz Taguchi (2010) draw attention, with reference to Colebrook (2002), to the view that in Western philosophy there has been a considerable bias towards the human subject seeing the world through a privileged optics that assumes ‘a strict distinction and hierarchical relationship between viewer and viewed’ (Hultmann & Lenz Taguchi, 2010, p.526). Denzin (2016) refers to a person as a cultural creation and suggests that every culture distinguishes different persons e.g. female, wife, daughter, son, professor, student, and so forth. He suggests that persons then build biographies and identities around the experiences associated with their cultural name (Denzin, 2016). These issues became particularly evident when my research took a posthumanist turn. ‘The challenge was then how to re-define the subject of knowledge and power without reference to that unitary, humanistic, Eurocentric and masculinist subject’ (Braidotti, 2019, p.43).

Once this challenge has been identified, it becomes progressively clearer that

*Beginning with the embodied idea that posthumanist research is an ethico-onto-epistemological practice of materially-emergent co-constitution, what emerges as ‘research’ cannot be ‘about’ something or somebody, nor can it be an individualized cognitive act of knowledge production. Rather, posthumanist research is an enactment of knowing-in-being that emerges in the event of doing research itself.*

(Taylor, 2016, p.18)

Consequently, research practice moves from ideas of reflexivity, which adopts an ontology of separateness and residual anthropomorphism, towards ideas of diffraction, which Barad (2014, p.168) describes as 'not a set pattern, but rather an iterative (re)configuring of patterns of differentiating-entangling'. Instead of privileging, the human posthumanist thinking understands human beings as entanglements of differing forces and intensities (Deleuze & Guattari, 2013). Diffraction, therefore, 'focuses on exposing patterns of difference, divergence and multiplicity' and is offered as an alternative to 'analytical practices reifying human agency, sameness and/or binary opposites' (Lennon, 2017, p.536).

Further to this, and in a more practical epistemological sense, Taylor (2016) talks of edu-crafting (p.20), an example of which

*...entails a collaborative investigation of how the curriculum is brought into being and enacted through a mutable range of posthuman materialities and spatialities. Activities include focusing on the nonhuman matter that textures the seminar room space, tuning into embodied enactments of space in classroom, experimenting with noise, atmosphere and light. The challenge of working out how to describe these activities, account for their effects, and explain the passages of affect they make possible, draws us further into the human-nonhuman conjunctions within the 'fielding of the event'.*

(Manning & Massumi, 2014, p.14)

LeGrange (2018) reinforces the point that (post-) qualitative research is post-anthropocentric, raising the issues of knowledge production and the particular questions with which (post-) qualitative researchers will need to engage.

Drawing on Lather & St. Pierre (2013, p.630), the following questions are raised:

*[En]tanglement makes all the categories of humanist qualitative research problematic. For example, how do we determine the 'object of a knowledge' – the 'problem' we want to study in assemblage? Can we disconnect ourselves from the mangle somehow (Self) and then carefully disconnect some other small piece of the mangle (Other) long enough to study it? ... How do we think 'a research problem' in the imbrication of an agentic assemblage of diverse elements that are constantly intra-acting, never stable, never the same.*

It is, therefore, with sensitive awareness of this context that I sought to pursue my research. I saw the opportunity to explore the experiences that I had had by turning to theory and to reading widely. My starting point was the connection



that I had seen between education, aesthetics and ecology, and I subsequently pursued reading in those areas. In so doing, I recognised that I had already started to engage with philosophy, a subject that encourages the asking of questions particularly on matters such as epistemology, ethics, aesthetics and politics. These questions were consistently open ended in that there was not any right answer and, in turn, led to the raising of even more questions, many of which positively guided the research programme in an open-ended way.

### **3.4 Transformative listening and reading**

This freedom to explore my intuition and conceptual leanings, informed to a great extent by extensive experience, needed to be architecturally constructed by reading widely around those intuitions. The first two years, the taught component of this professional doctorate, provided the space in which to explore the literature and to read outside the education cannon to bring it to bear on a new way of seeing.

At the start of the thesis stage, I read widely and eclectically in areas which I had never encountered before. It was hard. With a background in biology and education, now to be faced with ideas in philosophy, theology, quantum physics, the history of art and politics, wrapped up in, and entangled by, ontological approaches such as post-modernism and post-structuralism, was extremely challenging but hugely rewarding. This opened my eyes to unfamiliar ways of re-conceptualising previously familiar areas. This seemed to be at the heart of what education might be.

I listened to conversations in reading groups in which, I admit, I had little idea of what was being discussed. I read papers prescribed for the meetings and had virtually no idea what they referred to. I was out of my depth. I did not mind admitting it. I relished it. I was an educationalist of many years' experience and yet I had difficulty in understanding these particularly complex, and seemingly central, discussions about education. However, it was during those discussions that dialogic spaces appeared, which allowed new understandings to emerge. I realised that I was a part of creating those new understandings, not a bystander, and that I needed to listen carefully before contributing. This had not

previously been in my nature, and I recognised that this was a truly educational experience.

There was no expectation that I was the one with the answers, as so often was the case in my career, but it was all right to explore, to get it wrong and collectively reinforce opinion or challenge assumption. Through this discourse came new ideas, but it did not mean that everyone came to the same conclusions. It just meant that there was sufficient new understanding to apply to our own areas of interest and investigation. This process initiated speculation of the affective component of education and its anticipatory nature – what I came to think of as affective anticipation.

I began to realise, through these discussions, that my research study would very much incorporate these values, which, holistically and organically, encapsulated these perspectives. Affectivity has to do with sensitivity and ‘the co-ordinating rhythms that precipitate newness or change whilst also holding close to the often shimmering (twinkling/fading, vibrant/dull) continuities that pass in the slim interval between “how to affect” and “how to be affected”’ (Gregg & Seigworth, 2010, p.15). Anticipation, however, I consider to be concerned with futures thinking, complexity and emergence (Amsler & Facer, 2017; Facer, 2011; Poli, 2017). I consider both these notions, affectivity and anticipation, to be somewhat synonymous with aesthetics and most broadly with what Eagleton (1990, p.13) eloquently describes as

*nothing less than the whole of our sensate life together – the business of our affections and aversions, of how the world strikes the body on its sensory surfaces, of that which takes root in the gaze and the guts and all that arises from our most banal, biological insertion in the world.*

I appreciated the way in which, through the twists and turns of debate, the respect shown to others’ views and the differences of opinion brought to the discussion enriched everyone’s thinking. This required an openness to challenge and to change, a willingness to let go and a confidence to step into the turbulent waters of the unknown. It was a risky business, but then education surely is and, as Biesta (2013, p.1) puts it, ‘If we take the risk out of education, there is a real chance that we take out education altogether.’

These discussions and resulting interactions demanded the need to delve into the literature. What did other researchers, who were not at the table, think? How could I develop my own ideas in this context? Where should I start when I was trying to blend such disparate areas of concern? I found that when I talked about any aspect of my thinking someone would suggest I should read a particular book or article or explore the work of a particular writer. It all seemed a bit random, and I was exploring works that might ultimately have no relevance at all. So, I followed a course of taking advice from people I respected and trusted, and of reading what I thought might be interesting or relevant.

Very early on, a friend and research colleague from a different university listened intently to my attempts to explain what I thought my research was going to centre on (broadly aesthetics and ecology) and how I intuitively felt that it had relevance to education theory. He listened carefully and suggested that I might find the writings of Gilles Deleuze of interest – specifically the book he wrote with Felix Guattari: *A Thousand Plateaus* (2013). He advised that the book would be too much to read in its entirety, at this stage, but that it was certainly worth reading the first chapter, Rhizome (Deleuze & Guattari, 2013, pp.1–27).

Initially, there were sentences, or even parts of some paragraphs, that resonated with my early thinking. Deleuze and Guattari use a lot of biological terms, but it is not a book about biology. They place subjects, and subjective behaviours, much more holistically into the natural world and use relationships and the connectivity of organisms, including people, in a metaphorical way. But it is not a book about sociology. It refers to cartography, topology, tracings and maps, and different countries, but it is not a book about geography. They take examples from Freud, Oedipus and psychoanalysis, but it is not a book about psychology and, even though it refers to differences between East and West, and talks of war machines, it is not a book about politics. It is heterogenous, complex yet illuminating.

The title of this first chapter, Rhizome, gained more and more resonance as I explored the aspects of aesthetics and ecology that I had become fixated on. I noted that this term, rhizome, which biologically refers to ramifying, subterranean, horizontally growing stems that send shoots and roots out at various points along their length, had been adopted in a range of the literature

which I was to encounter. While I recognised its biological significance, the metaphor was very powerful in elucidating the interconnectivity and complexity of life and ideas.

This idea of rhizomic activity is exhibited in practice. The development of the college's art gallery, for example, arose in that sort of way. There was never a time when one person sat down, conveyed the idea of a gallery and then predicted all the ways in which it would make a difference. It was presented as an opportunity, a space in the thinking, and was adopted with a view to seeing how many different agents might interact. It was seen as a project that should develop just as a work of art might do, through interaction with the environment. It was experimental, somewhat unpredictable and the developments were spontaneous.

The concept of a rhizome is a stronger metaphor than, and is juxtaposed against, the notion of the branching and rooting exhibited by a tree, for example, which Deleuze and Guattari find limiting in that they rely on binary logic. They prefer a metaphor that relies on multiplicities and assemblages. Multiplicities are rhizomatic, they claim, and have neither subject nor object, 'only determinations, magnitudes and dimensions that cannot increase in number without the multiplicity changing in nature' (Deleuze & Guattari, 2013, p.7). Consequently, an assemblage is an 'increase in the dimensions of a multiplicity that necessarily changes in nature as it expands its connections' (ibid), or as Deleuze and Parnet (2002) say, as quoted in DeLanda (2016, p.1):

*It is a multiplicity which is made up of many heterogenous terms and which establishes liaisons, relations between them, across ages, sexes and reigns – different natures. Thus, the assemblage's only unity is that of a co-functioning: it is a symbiosis, a 'sympathy'. It is never filiations which are important, but alliances, alloys; these are not successions, lines of descent, but contagions, epidemics, the wind.*

(Deleuze & Parnet, 2002, p.69)

Applications of these concepts are difficult to grasp, and sometimes the meaning seems always to be just out of reach, so I found that they needed to be returned to again and again, stealthily, from different directions. Indeed, seeming to understand them, and then apply them to other concepts or even real life, often came at surprising moments, as if catching glimpses of them in

the mirror or, perhaps more accurately, as through the looking glass. I found these glimpses in other areas of the literature and in my own thoughts, re-appearing in different guises, and I was able to elaborate on them. The developmental ideas that they led to in my own thinking and writing formed an assemblage of their own, in a rhizomic fashion. There was certainly no linearity in the way my ideas were forming, more a continuous aggregation, the development of a loose mesh, which, when cast, captured material that could be woven into the forming fabric of this interconnecting, aesthetic coat.

Not unsurprisingly, I was drawn to writings in the natural sciences, which philosophically bound themselves into potential conceptions of education. Early in my research, I surveyed the writing of Henri Bergson (1859–1941) who, while not a scientist, explored scientific ideas, notably those of Darwin, to illustrate his philosophical ideas, which were expounded in his most influential work, *Creative Evolution*, (Bergson, 1922). Also interesting, and no less important in terms of some of the ideas he proposes, is *Time and Free Will* (Bergson, 1913) which, grants permission to look at relatively familiar concepts in very different ways. Both these books, like others I encountered, are not so much influential in what they say, but in ways in which the ideas are interpreted by others. Thus, the nature of ideas develops into a culture of thinking. I realise now that my research evolved like this. There never seemed to be an outcome of things, just a trajectory. In this way, to borrow from Bergson, as interpreted by Herbert Mead:

*The motion comes first, with reference to something which is already there. But it is our adjustment to it, that is first given in experience. This is the sort of picture of the world that Bergson presents. It is always moving on toward a future which is just arising. What it is you cannot tell until it does arise. But it is always coming into existence, and we are always adjusting ourselves to it, finding out what it is by the very process of change. This is the sort of evolution which is taking place, a process ceaselessly going on with continued adjustment, with a future actually affecting that which is taking place.*

(Mead, 1936, pp.301-2)

This is not just a philosophical point. Interesting and productive curriculum projects displayed this rolling affectivity and anticipation. The more that targets were imposed, the more stultification of activity there appeared to be. This was

so to a certain extent for each of the projects I have used as examples in this thesis, although some lend themselves to greater freedom than others. There is also an element of increased responsibility and accountability in, for example, the centre for students with ASD, because of the essential legal frameworks. Quite rightly, this imposes a stronger accountability dimension through an enhanced duty of care.

### **3.5 Aesthoecology: metaphorical and ethical dimensions**

This quotation from Mead does not only describe, very well, the research process I was going through but is at the heart of the perceptual elements of aesthetics and interconnectivity of ecology that I had been toying with. It also links these aestho-ecological notions to the elements of education that, to me, are important. My research questions were appearing from the mist but all too often in the succeeding months, very frustratingly, would disappear again across the horizon. What I began to be clear about was that the aesthetic and ecological dimensions of education are not something that can be investigated in a small-scale research project, because the framework of a new, or developing, ontology needs to be established. More than this, it might be better described as onto-epistemological and, at this stage in my deliberations, I wanted to be expansive in my research.

I continued reading. Inspired by Bergson (Bergson, 1913; Mullarkey & Ansell-Pearson, 2014), I wrote some paragraphs about the concept of time, envisioning this metaphorically as a fast-flowing stream. I imagined this torrent of water forming and reforming, following a general direction of the landscape and yet changing the landscape as it flowed. The pattern of the water, on both a micro and macro level, did not have a plan; there was no teleological destiny. Obstacles would create changes, but such that they were part of the overall patterning. There were water, rocks, sand, stone, aquatic creatures, algae, rooted plants, dead material and living material, all of which combined irrepressibly into one body and each of which exerted influence on the other, but in varying amounts at different times. There was a temporal evolution to it – effective and affective forces – and if you took one element away from any other at any one time you had nothing. There was no sense of individuality here. The

metaphors were abundant. It is impossible to watch the flow of water without watching that which is caught up in it, the bubbles formed by it or the noise created by it. It is a dance with no choreography but with captivating rhythm and movement. The way it forms and breaks, circles and then crashes, speeds up and slows down has a continuously changing symmetry to it. First it forms and then it breaks. First it is coherent and then chaotic. Yet I am misleadingly giving it a temporal dimension in describing it as having a starting point – ‘first’. I must assume, therefore, that it has a ‘last’. However, there is no first or last, no obvious start or finish. It is continuous, almost indefinable, largely unpredictable and yet with a comforting sense of purpose. It seems entirely random and yet it has a pattern. That pattern is the symmetry, and then the apparent breaking of that symmetry that surely is encapsulated in the aesthetic realm.

At this stage, I turned first to science and explored the work of Prigogine and Stengers and their seminal book, *Order Out of Chaos* (1984). This book captures important elements of the aesthetic nature of materials, their connectivity and those concepts we might conceive as harmony, beauty and unity, and yet from a scientific perspective. However, these are by no means concerned with the maintenance of stasis. Quite the opposite – they are about the dynamic processes that continuously evoke transformations.

These elements are also fundamental to the work of James Lovelock, who proposed the Gaia hypothesis, through which he sees planet Earth as an integrated, self-regulating system of interdependent parts, exhibiting small- and large-scale homeostatic mechanisms (Lovelock, 1979). Seen in metaphorical terms, the notion of Gaia, perceived as an organism with autopoietic and self-regulating characteristics, captures the importance of the inter-connectivity between the animate and non-animate elements of the world and the transience of individuality. It is a precursor to important questions concerning the centrality of *Homo sapiens* and the distorted anthropocentric nature of our society. By the very nature of this perspective, there must be ramifications for our understandings of education processes.



Figure 7: Planet Earth (image from Nasa), illustrating Gaia [Photograph by Aphelleon]

Writers that led me into thinking more about the relationships between aesthetics, ecology and education are Arnold, Ruskin, Morris, Dewey and Collingwood, and I have found myself drawing significantly on their influences. I also draw on more modern thinkers and philosophers, such as Jacques Ranciere, Arnold Berleant, Brian Massumi, Timothy Morton, Jane Bennett, Mikel Dufrenne and Elliot Eisner, all of whom offer a particular perspective on politics, art, architecture or the environment, and in whose coalescent thinking I have found some relevance to the notion of aesthoecology.

In considering aesthetics and ecology, we are always brought back to a philosophy of life itself. Jonas (1966), in *The Phenomenon of Life – Toward a Philosophical Biology*, acknowledges that the organic facts of life and ‘the self-interpretation of life in man’ must be dealt with by interpreting the way in which organisms have met the challenge of the world. He recognises that this is through ‘metabolism, sentience, motility, emotion, perception, imagination, mind’ and the ideas with which man in history has met the theoretical challenge of life’s nature and his own: the latter theme being inevitably moral and in the end metaphysical (Jonas, 1966, p.6).

This approach may present a challenge to the way in which we engage with ethical matters, matters that Barad (2007), for example, would approach in an



ethico-onto-epistemological way, by a process of diffraction as opposed to reflection. The process of diffraction understands the human being as an intimate part of assemblages and not as uniquely agentic (Barad, 2007; Lennon, 2017). Diffraction exposes patterns of difference within entanglement and is 'a way of doing research in which knowledge is always in process, always becoming and where transformation emerges in intra-action' (Ivanson & Renold, 2016, p.171). This linking of understanding and knowledge to ethics emphasises the idea that one cannot but ethically engage with the world, particularly within the contextual understanding that human and non-human beings intra-actively co-constitute the world.

This conjures the idea that it is not necessarily a sense of responsibility that is key but, controversially, more so a relational attitude of response-ability (Haraway, 2008, p.88). This is echoed by Jonas (1966) in setting out his idea that 'a philosophy of mind comprises ethics – and through the continuity of mind with organism and of organism with nature, ethics becomes part of the philosophy of nature' (ibid, p.282). Consequently, he suggests that 'only an ethics which is grounded in the breadth of being, not only in the singularity or oddness of man, can have significance in the scheme of things' (ibid. p.284).

### **3.6 Holism and interconnectivity**

This response-ability (Haraway, 2008), therefore, moves us away from the anthropocentric dominance of recent history and stimulates new understandings of relationship. This new relationship, described best by a new emphasis on art and humanities rather than by a conventional view of science, emphasises the importance of aesthetics, affect and agency. Two philosophical writers who initially influenced me in this new direction are Timothy Morton, and his book *Hyperobjects – Philosophy and Ecology after the End of the World* (Morton, 2013) and Jane Bennett in *Vibrant Matter – A Political Ecology of Things* (Bennett, 2010).

One review of *Hyperobjects* (Morton, 2013), by Clough, sums up the contribution that his book makes to ecological and global understanding:

*With a world melted by global warming, Timothy Morton gives us a much needed concept, the hyperobject, and surrounds it with a consciousness of the planet that is not ours. In these times, there can be no critical theory or philosophical meditation without turning to Morton's writings; at once political, poetic and personal, they offer a brilliant elaboration of object-oriented ontology.*

(Morton, 2013, back cover)

This was enough to entice me to explore Morton's books, and I shall draw on his influence throughout this thesis. On the surface, he draws his inspiration from ecological crises confronting the planet, but way beyond that he explores 'the ecological thought' that he describes as 'the shadow of an idea not yet fully thought, a shadow from the future' (Morton, 2012, p.2). This anticipatory approach goes beyond the brandishing of political slogans and cynical manipulation of purported evidence bases. Although referring to the essence of ecology, his eloquent descriptors of its importance strongly resonate with my understandings of the fundamental aspects of education. He says of ecology, for example:

*It has to do with capitalism and with what might exist after capitalism. It has to do with amazement, open-mindedness and wonder. It has to do with doubt, confusion and skepticism. It has to do with concepts of space and time. It has to do with consciousness and awareness. It has to do with ideology and critique. It has to do with reading and writing. It has to do with race, class and gender. It has to do with sexuality. It has to do with ideas of self and the weird paradoxes of subjectivity. It has to do with society. It has to do with co-existence.*

(Morton, 2012, p.2)

I subscribe closely to this holistic description of ecology, with all its complexity, but it can also be beautifully applied to education. Ambitiously, I apply it also to the approach I have adopted towards my research. The ecological condition recognises the catastrophe that awaits us, and hyperobjects are

*the harbingers of a truly post-modern age, in which all humans ... are now aware that they have entered a new phase of history in which non-humans are no longer excluded or merely decorative features of their social, psychic, and philosophical space.*

(Morton, 2013, p.22)

Recent, but frighteningly belated, alerts to the pervasive nature of plastics is just one very stark example of this. And there will be more – many more. Education will be a long way behind this curve of awareness. If education equates to ecology in this and many other ways, and if we are not careful, educational thought, like ecological thought, will cast itself like a shadow from the future (Morton, 2012).

This type of awareness questions, in a way that was not thought possible before, the generally accepted notion of a life-matter binary. We are what we engage with, whether this be ideas or things, and therefore our understandings are the result of interactive interference from many bodies, forces and collaborations, many of which we may have no immediate sense of. In general terms, this may be considered to be thing-power, which Bennett (2010) considers to be vibrant matter and Deleuze and Guattari (2013) would define as an assemblage. Bennett's definition of assemblages is 'living, throbbing confederations that are able to function despite the persistent presence of energies that confound them from within' (Bennett, 2010, pp.23-24). This may be contentious but provides a platform for a greater understanding of vital materialism, interconnectivity and agency. Bennett refers to this as *shi* (from the Chinese), which is to do with the release of energy from the very nature of things. Within a school, for example, there is 'a mobile configuration of people, insects, odors, ink, electrical flows, air currents, caffeine, tables, chairs, fluids, and sounds' (ibid, p.35). All of these interact in a temporally random fashion, from which emerge new patterns of behavioural ecologies.

Once one is aware of the potential of 'thing power', the impact of interactive interference becomes more obvious. I can think of many examples of changes in the ecology of a room having an effect on students. This was particularly highlighted in the centre for children with ASD. Children with ASD are particularly sensitive to objects and stimuli around them. However, it is the combination of changes and the juxtaposition of one thing to another that can often have the most affect. Often, we can underestimate sensory sensitivity but having children with ASD within a school or college beneficially highlights these affects. A mother of two children with ASD describes in the book, *George and Sam*, their first day at school and their sensitivity to the school environment:

*Strip lights flicker, radiators hum, the chatter of other children is bewildering and incomprehensible. The walls are covered in a confusing jumble of colour and sparkle. Classrooms are rearranged – you’ve just got used to one layout when you have to start all over again. Smells of cooking or cleaning fluid, or even the teacher’s perfume, are overpowering. You can’t take in the teacher’s instructions – she talks too fast, and her earrings jangle.*

(Moore, 2004, p.177)

Understanding the differences there are in the way people perceive the complexity of the environment is important in understanding the potential of assemblages in effecting behavioural ecology.

Each of the elements contributing to this ecology are referred to by Bennett (2010) as actants, and she speculates on the question of their role in political activity. Drawing this tentative comparison between ecosystems and political systems, and without being excessively anthropomorphic, raises a dilemma about who, or what, is the public in an assemblage of actants and to what extent any one actant has free will or agency. Guattari (1995) refers to the ethico-aesthetic paradigm, which assumes a nature-culture continuum constituting a revolutionary democracy in the act. This might be favourably compared with the work of Latour (2005), who proposes that the concept of nature should be replaced by constructing a common world, which assembles humans and non-humans in a new democratic institution (Massumi, 2014).

Whichever of these views one relates to, what comes through the literature for me is that there is a strong and growing body of opinion that the centrality of *Homo sapiens* is being rethought, and a conception of the world, in which we as humans are paramount, is being critically questioned. The question that flows from that is: How do we correct the balance, even if we can, between our aesthetics – the way we perceive the world – and our ecology – our inter-action within it? This raises serious ethical questions, many of which need to be considered through our relationship to education. This posthumanist stance, and the rise of new materialism, may provide a method or a conceptual frame, as well as a political focus, within which I explore further the symbiotic relationship between aesthetics and ecology, leading to further consideration of its significance to the education imperative.

### **3.7 Posthumanism: a new relationship with the material world**

New materialism considers issues of matter, agency and posthumanism, a major claim of which argues for the breakdown of the distinctions between nature and culture (Braidotti, 2013; Haraway, 2008). This is a recognition that the material world is not a fixed entity but is continually in flux (Barad, 2007; Coole & Frost, 2010) and has the capacity for agency that extends beyond that of humans (Braidotti, 2013; DeLanda, 2006; Latour, 2005).

Connolly (2013) visualises the impact of these characteristics of flux and agency as a pincer movement. The downward pincer is considered as a suddenness of an idea emerging from nowhere, a moment of individual onto-creativity, which, he speculates, also occurs in political events, ethical judgements and new social movements. The upward pincer is explored in philosophy and complexity science, in which there may be a consensus that there are periodic moments of criticality in, for example, species evolution, climate change, geological processes and ocean current shifts. This is manifested in organic periods of real uncertainty and real creativity.

This represents a challenge to assumptions about the relationship between the human and the world, as well as a re-orientation of the dominant position of anthropocentrism. This echoes the position I have taken in elements of my notional construction of aesthoecology and, in turn, examines the part played by nature-culture and affect-effect in anthropological and education contexts.

Posthumanism and, by association, new materialism are best envisaged as a positive development from a historical perspective, rather than a negative reaction to critical situations. Thus, new spaces emerge within which different and radical ways of thinking about our environmental and educational condition are encouraged to arise. This has the potential for promoting the development of new landscapes, a cartography that manages to reconfigure our subjectivity in a non-linear temporality. This emergent transition process from our current subjective position to the kind of subject we are becoming is not a question of either-or, but and-and. This has the potential for moving the debate into a new type of politics, the coming of age of matter politics, as a sub-field of political theory and educational philosophy.

Reconfiguring new materialism is not new. For example, Marx claims that his new materialism stands opposed to Hegel's dialectic materialism. This emphasises the importance of change and that the focus of this change was from civil society towards social humanity. Consequently, Marx has an imaginative and embodied cognitive view of materiality, which reflects a phenomenological approach. This was able to creatively structure political context, material processes and social realities.

Historically, these radical political implications on materialism emerge as a series of important developmental steps in the nature of materialism (Ellenzweig & Zammito, 2017; Rekret, 2018). Structuralist discourses influenced by Marx, for example, refer to materialism as the implementation of social structures, particularly those that organise production, as effects of human practices. The second genre is post-structuralist, focusing on the production of material body through discourse. The third emerges from the experiential, which invites engagement with the classical pragmatists such as William James and John Dewey, who exhibit cross-boundary thinking in exploring the paradox of human experience as embodied subjectivity.

New materialism, therefore, possesses the ability to challenge anthropocentric approaches to cultural practice and the dualist ontologies of mind-body, self-world and nature-culture (Fox & Alldred, 2017). This is an approach that may be useful in examining further aspects of aesthetics and ecology, particularly because the shift is from individual, human subjects towards an emphasis on assemblages of animate and inanimate affect in which desires, feelings and meanings make an important contribution to the social world. A post-human focus does not privilege humans in relation to any other part of the environment and, therefore, a nature-culture continuum illustrates a more self-organising emphasis on living matter (Fox & Alldred, 2017).

From both an aesthetic and an ecological perspective, a posthuman focus supports an emergent and ecological philosophy and politics, which depend on two assumptions: firstly, that things are only what they are in relation to other things (synchrony); and secondly that all things derive from other things (diachrony). Therefore, nothing exists by itself and nothing comes from nothing – everything is interdependent (Morton, 2012). In biological terms, this would

have been called a chain or a web, but these inter-relationships are now to be considered much more complex and profound than that. Morton refers to them as a mesh. Others have considered them to be more like a felt, in which, as opposed to in a woven piece, the strands become so intertwined that they become one piece of material that cannot be disaggregated.

The analogy of a mesh has distinct advantages.

*'Mesh' can mean the holes in a network and the threading between them and it suggests both hardness and delicacy. It has uses in biology, mathematics, and engineering and in weaving and computing – think stockings and graphic design, metals and fabrics. It has antecedents in mask and mass, suggesting both density and deception ... Since everything is interconnected it has no definite background nor any definite foreground.*

(Morton, 2012, p.28)

Each point of the mesh is both the centre and the edge of a system of points, so the centre and edge are ill defined. Morton problematizes this theory from the standpoint of ecological entanglement. He proposes that an ecological criticism must remove the division between nature and culture and challenge the idea that nature exists as something that supports and nourishes civilization but outside of society:

*Ecological writing keeps insisting that we are 'embedded' in nature. Nature is a surrounding medium that sustains our being. Due to the properties of the rhetoric that evokes the idea of a surrounding medium, ecological writing can never properly establish that this is nature and thus provide a compelling and consistent aesthetic basis for the new worldview that is meant to change society. It is a small operation, like tipping over a domino ... Putting something like Nature on a pedestal and admiring it from afar does for the environment what patriarchy does for the figure of a Woman. It is a paradoxical act of sadistic admiration.*

Morton (2009, pp.4-5)

New materialism, therefore, looks beyond the human. It examines the nature of things and objects and the vibrant connections existing between the human and the non-human. This may be seen to operate as a complex web of networks, assemblages or compositions, which constructs an ontology of what is happening around us, with us and through us and reformulates how we perceive this world and most importantly how we act within it. This has ethical

and political implications enmeshed within an aesthetic and ecological framework. The aesthetic aspect concerns our senses, and the ecological aspect explores the dynamism and complexity of resultant interactions to the point that the result may be considered more as a plasma than a mesh.

I have proposed the idea of a symbiotic relationship between aesthetics and ecology as being the basis of this formulation – an aesthoecology. Symbiosis represents a dependency model of a relationship that defines itself through mutual advantage. In its strongest form, this mutuality becomes a relationship that has total interdependence and consequently transformative qualities. Through examination of new materialism, it can perhaps be perceived through objects, ideas or knowledge relationships. These symbiotic relationships form our changing epistemological landscapes, which arise through experience.

A consideration of aesthoecology relates to both posthumanist and new materialist ways of seeing and doing. Aesthetics is our way of seeing the world, the way in which we utilise our sensorium and our imaginaries to make some sense of our encounter with the world. This relationship is bound into our ecology – our relationships with things around us – people, other organisms and matter. I propose that neither the aesthetic nor the ecological are dominant, but they work together. They interact to formulate our landscape. Beauty, nature and landscapes are all things that are often thought to be separate, out there, somewhere else or in the distance, whereas I want to paint a picture of their intrinsic quality, and our subjective continuous role in formulating all those things. I am interested in the ways in which our nature and culture coalesce and form an aesthoecological network, which can be applied to enhance our traditional understandings of education.

### **3.8 Summary**

Educators need to take seriously the interconnectedness of materiality by considering that all forms of matter – human and non-human, animate and inanimate – have a vibrancy and an agency that can extend sensibilities and understandings of our place in the world over and above the classic representation of symbolic or cultural meanings. This requires the adoption of a



thinking, contemplative and experiential approach, which concerns 'being with things' (Bennett, 2010). In accepting the creative potentiality of all matter, conventional thinking can be disrupted and, thereby, transformational thinking adopted. By focussing on objects, connections, interconnectedness and change in a non-hierarchical way, opportunities arise for imaginative and emergent forms of theory and practice in a variety of contexts. This acute awareness of new materialism fosters socially responsive and sustainable practices, which heighten essential understandings of response-ability and ethical action.

Posthumanism and new materialism provide a different and supportive lens for clarifying this, but answers do not lie in one area of expertise. Inspiration and practical solutions need to be drawn from contemporary thinkers in complexity theory, neuroscience, biology, geography, politics and critical philosophy.

According to Taylor (2016):

*Posthumanism is a mobile term, a concept in motion, an active theoretical assemblage. As an itinerant constellation of differing intellectual vectors and scholarly convocations, it gives rise to a complex mix of anxieties and fears as well as pleasurable fantasies, hopes and dreams about the newly possible in educational research.*

(Taylor & Hughes, 2016, p.21)

In subsequent chapters, I explore the importance of the relationships between aesthetics and ecology leading to further consideration of the significance of this relationship to the education imperative. My thesis develops the argument that aesthetics and ecology, particularly in combination, have a significant part to play in the education imperative and that education has enhanced impact when viewed across a wide variety of enmeshed learning environments.

# Chapter 4 – Crossing Boundaries and Emerging Landscapes

## 4.1 Introduction

In the previous chapter, I started to develop an argument for a theory of aesthoecology and progressively referred to its implications for education. Aesthetics and ecology, while existing as separate entities, naturally exert greater influence when in a symbiotic and dynamic relationship – that which I define as aesthoecology. In this chapter, I develop this significance in more detail by examining examples of practice and themes of aesthoecology that are important to the understanding of emerging education landscapes.

I propose that an understanding of aesthoecology cannot only be argued to permeate much of what should be apparent and worthwhile in our endeavours in education, but also that it may help to frame a future generation's response to the critical issues of the day and beyond, such as climate change and environmental concerns, wellbeing issues, equality matters and inter- and intra-cultural dynamics.

I propose that organisations extraneous to the accepted institution of the school have much to offer in curricular and pedagogical processes. Having described the way that museums were instrumental in catalysing new views of education for me, I became aware of how new spaces can open up possibilities for thinking differently. Museums and galleries, for example, can play a distinctive role in opening spaces, through liminality or holding spaces, for exploring issues that are not only present in the immediate but also in anticipating futures. This forward-looking, anticipatory, educational modus operandi represents an approach that takes account of emergent futures and operates through aesthetics, ecology and rhythmicity. Education flourishes through recognition of the inter-connectedness so paramount in any understanding of aesthoecology. Museums of art and culture, for example, are able to present artworks in political contexts, which illustrate dissensus – the cutting and the tensions required to expose paradoxical, insurmountable and recurring issues emanating

from being human in the first place. Paulo Freire puts it clearly when he describes education as

*simultaneously an act of knowing, a political act, and an artistic event. I no longer speak about a political dimension of education. I no longer speak about a knowing dimension of education. As well, I don't speak about education through art. On the contrary, I say education is politics, art and knowing.*

(Freire, 1985, p.17)

Assuming this understanding of education, aesthoecology is not a subject within an education framework, nor is it a theme, but I argue that it is at the very core of the education process – the very rhizome of the education imperative. It is a way of being and a way of becoming (Biesta, 2006; Braidotti & Bignall, 2019). Freire provides a locus for aesthetics in his pedagogy within which ‘the beauty of pedagogy/literacy/teaching seems to indicate that the aesthetic dimension is not solely in terms of the results (production of new knowledge/new subjectivities) but in the very practice of education itself’ (Lewis, 2014, p.58). Freire is very clear that he does not speak about education through art but rather that he considers education itself as an aesthetic event. This is also evident in the work of John Dewey in his books *Experience and Nature* (1925) and *Art as Experience* (1934).

This approach requires those involved in education, and that should involve most people most of the time in varying capacities, to share in that openness to the possibilities that the future holds. In recognising that by placing ourselves in that ‘betwixt and between’ liminal space (Conroy, 2004), we are offering ourselves up for the affective anticipation of change. In this chapter, and before exploring aesthoecology further, I frame some of the emerging characteristics of aesthoecology with examples of practice. I consider that to see education in aesthoecological terms is a transformational starting point from which changes in perception might allow reconsideration of current perspectives.

## **4.2 Nature and culture: an educational contention**

Within this reconsideration, it is considered that there is a distinct connection between aesthetics and affectivity (Cullen, 2018; Guattari, 1995). Perhaps any

lack of the appreciation of aestheticism in education may be one of many good reasons why students become desensitised to their imposed educational experiences (a form of an-aesthesia), particularly at secondary and high school level (e.g. Riley et al., 2005; Harber, 2008; Lewis, 2015; Cullen, 2018).

My experience has been that the rhetoric of successive UK governments gives the illusion of providing greater power and autonomy to schools and teachers while simultaneously increasing levels of prescription and accountability. From an aesthoecological perspective, the more narrowly that education is defined the more likely it is to slip from the grasp, because it possesses an ethereal quality that is more about the unknown than the known, the emergent than the prescribed and the illusory than the definitive. The ethereal qualities of liminality encapsulate the potential beauty of the educational experience and highlight the potentiality of aesthetic anticipation. Liminality, as I discuss in Chapter 6, refers to a state of transition from one form to another – a transformation. Originally adopted by anthropologists, it has now become an important term of social thought and philosophy (Horvath et al., 2018). It may, therefore, be of relevance to an anticipatory mode of education, which, in an aesthetic form, does not in itself perform a societal function but has intrinsic value in its own right (Osberg, 2018). It is when it is in relationship, as an ecology, that its significance widens and takes on a different form.



*Figure 8: Rocky shoreline – liminal zone between sea and shore [Photograph by Dom 1530].*

Amsler and Facer (2017) suggest that the unique role of a socially and ecologically relevant education today is thus not to resolve but to put into play relationships 'between past and present, present and future', and they imagine education as

*an 'ecotone', a boundary state or estuary between two conditions such as river/sea or woodland/river in which temporal dynamics are put up for grabs and new possibilities are able to emerge, a space where teloi themselves become objects of play.*

(Amsler & Facer, 2017, p.9)

It is in this view of an ecotone that bears some resemblance to the relationship I draw between the aesthetic and the ecological, the affective and the connected. This boundary state, or liminality, is the critical condition for the emergence of the creative future. While I maintain that the future is opened through a continuous series of liminal situations in which liminality is unstructured, Turner (1969) maintains that it must also be considered as the origin of new structure – 'the point of departure for the birth of new forms of cultural and social life' (Thomassen, 2018, p.55). Therefore, 'liminal phenomena are at the level of culture what variability is at the level of nature' (Turner, 1969, p.85). This has some resonance with the notion of symmetry breaking or bifurcation (Prigogine & Stengers, 1984), which I discuss in greater detail in Chapter 6, and in which following significant periods of stability new forms emerge, often spontaneously and unpredictably.

However, in times when individuals and groups are called on for constant innovation and improvement, liminality may become institutionalised. In that case, it loses spontaneity and even seems to become a permanent feature. This calls on people to continually assess, improve and reform, and this distortion of liminal conditions produces increased evidence of innovation capacity or burn out (Thomassen, 2018, p.55). This may progressively be seen in contemporary education as that which might indicate a difference between aesthoecological understandings of liminality and the cultural, enforced goals of effective education that institutionalisation encompasses. Consequently, the 'constant pressure to innovate and transgress boundaries at all levels of social

life [is] in dire need of problematization. In this view liminality stands as a crucial concept in our attempts to diagnose the times in which we live' (Thomassen, 2018, p.56).

Liminality suggests spaces from which the new can emerge and, by crossing boundaries, or fusing boundaries or passing through a threshold of change, landscapes change (Horvath et al., 2018). In educational terms, these eduscapes can both create and transcend cultural norms. Consequently,

*it is essential to recognize that there is no such thing as pure perception. All sensory perception passes inevitably through the multiple filters of culture and meaning: the concepts and structures supplied by language and the meanings instilled by culture. To these influences we must add personal experience in the form of the many activities that constitute daily life, education, and the influences that inform acculturated experiences.*

(Berleant, 2010, p.27)

My contention is that the aesthetic is frequently subjugated to the greater political emphasis on institutional functionality and effectiveness, an approach that has become so prevalent that it is now deeply seated in current education culture. One key reason for this is the drive for accountability, which becomes much more straightforward if systems are simple and easily quantifiable within an input/output, linear model.

*After all, the colonization of the future and the active construction of hopelessness, in particular, disrupt the historic anticipatory logic shaping formal education in modern capitalist societies; namely, the linear theorisation of the relationship between learning-in-the-present and being-in-the-future. This logic has underpinned 'liberal', 'conservative', 'progressive' and 'radical' models of schooling within the twentieth-century Anglo-European 'education debate'. Indeed, the debates of the 20<sup>th</sup> century were characterised not by the question of whether it is possible to create human beings and social futures through education but which subjects and societies were desirable and how methodologically to educate them.*

(Amsler & Facer, 2017, p.2)

Much emphasis has been put, in the past 25 years, on the importance of the concept of the learner or the notion of learning. References to the learner (Biesta, 2006; Illeris, 2006), the learning organisation (Garratt, 2000; Senge, 2000), learning futures (Facer, 2011) and lifelong learning (Rubenson, 2004;

Schuller & Watson, 2009) all put the emphasis on this assumed process of learning and responsibility on the individual. However, learning is common to all organisms as a very natural process on a minute-by-minute basis, so to live at all is to be a continuous learner. To process that learning, to guide the learning, might be argued to be inherent in a process of education.

### **4.3 Theories of learning and education**

Illeris (2009, p.3) claims that learning can be broadly defined as ‘any process that in living organisms leads to permanent capacity change and which is not solely due to biological maturation or ageing.’ However, it is clear that learning is much more complicated than this. In the last one hundred years, many theories of learning and education have been proposed, which broadly fall into four main categories: mechanical learning, assimilative learning, accommodative learning and transformative learning (Illeris, 2009). New philosophies have been proposed in recent years (e.g. posthumanism and new materialism) which are now being applied to education alongside, or in addition to, these existing categories (e.g. see Taylor & Hughes, 2016).

*Mechanical learning* relies on the combination of acquired and recalled learning targets. It is often referred to as conditioning and refers to learning that occurs without any particular context, something new but unconnected to anything else. *Assimilative learning* is a process that involves adding new pieces of learning to that which has already been acquired. Consequently, a map or schema of learning is developed that allows for relatively easy recall of knowledge within specific contexts. This is one of the more basic aspects of learning within the confines of particular school subjects in secondary schools, e.g. mathematics or language learning, in which teachers will argue for regular reinforcement, a lesson a day, in order to build one idea on another. This has been emphasised by Ofsted (2019) with reference to cognitive load theory [CLT]. It is suggested that CLT works best by ‘teaching in small chunks and not organising activities that require too much memory capacity, until learners acquire the knowledge that allows them to spend less time processing content’ (Ofsted, 2019, p.17). Hence, it may represent one of the underpinning arguments for the tradition of a conventional secondary school timetable but

may also be the reason why that which is learnt in school is often difficult to apply to contexts outside of school, or even contexts outside that lesson.

*Accommodative learning* takes effect when a conventional schema, or structure, is insufficient to accommodate any new learning which arises. In this case, the learning process has to become more flexible and adaptive. This type of learning is more demanding in that it generally requires internalisation and deeper understanding. The advantage is that it is more adaptable to new situations and can be applied to different contexts. Examples of this may be found in the theories of Argyris and Schön (1996), which identified types of reflective learning that respond to the dynamism and pace of change in organisations, institutions and societies. Senge (2000), in referring to the work of Schön (1983), points out that 'problems encountered by educators involve conflicting frames and values that cannot be resolved by drawing on technical knowledge might be tackled by accommodative learning.' He suggests that 'these indeterminate zones of practice are the most central to professional work' (Senge, 2000, p.282). Accommodative learning has been adopted in the theories of school leadership, for example, particularly in circumstances involving uncertainty, complexity and value conflicts. It has often informed, for example, the theory of critical reflection in the professional development of teachers (see e.g. Harrison, 2003).

Another type of accommodative learning is represented by the ideas of Vygotsky (1978) which, in their most elaborate form, develop 'conceptual tools to understand dialogue, multiple perspectives and networks of interacting activity systems' (Illeris, 2009, p.55). This 'Vygotskian', social constructivist framework has been elaborated by researchers such as Bakhtin (1981) and Engeström (1995), both of whom rely on the notion of activity systems. Activity systems depend on cultural mediation and constantly shifting networks of relationships, which Latour (2005) expands further into his actor-network theory (ANT). ANT begins to incorporate other-than-human capacities into a system of networks. These concepts of social learning have been helpful in my understanding of more complex situations in education and in describing particular education contexts. For example, the nature of the lunch club or the art gallery, which I have used to amplify my notions of aesthetics and ecology in



education (Chapter 2, section 5), might well be described in socio-constructivist terms.

Activity networks are profoundly important in that they lead to more expansive transformation. Expansive transformations work through relatively long cycles of change, which is what happened in, for example, the lunch club. Each session tended to lead to a progressively wider range of possibilities. Bateson (1972) considers this process of transformation as activities that are 'not even defined or understood ahead of time', such that they are 'learned as they are being created' (Illeris, 2009, p.58). This leads into a consideration of emergentism, in which completely new properties arise that could not have been deduced from any previous set of circumstances (Osberg & Biesta, 2007).

More recent philosophical work, such as new materialism and posthumanism, take the ideas of transformation into a very different dimension and offer a new perspective and frame within which to consider education. Posthumanism focuses on the idea of de-centering the human and moving from the idea of educational subjects towards educational relationality (Ceder, 2015). In taking a posthumanist stance, the ideas of a humanist approach to learning would be heavily criticised, as I have explained in Chapter 3 (3.3). The posthumanist stance would be critical, for example, of the ideas outlined above on reflexivity. Therefore, instead of a series of aggregates consisting of separated entities and temporary inter-action, a posthuman approach proposes more complex intra-actions, entanglement and materiality as the primary relational elements. It is with serious consideration of these types of post-anthropocentric understandings that the ideas of aesthoecology are explored and embedded, which becomes clearer as this thesis progresses.

In that sense, I propose that education is the process of bringing learning into consciousness and, in order to do so, a connectivity is required. Biesta (2006) comments on the prominence of the concept of learning and the decline in the concept of education. Education is primarily a process that involves others, is shaped by interaction with others and is, consequently, a cultural process initiated through action.

If this is the case, then inter-relationships and intra-relationships are particularly relevant to schools that work closely with their communities. The idea of 'community education' (Tett & Fyfe, 2010) and 'lifelong learning' (see e.g. Bynner, 2016) underpin the examples of practice that I use to exemplify my theory of aesthoecology. There is overlap here with 'schools without walls' (e.g. see Partridge & Bath, 2019) and an understanding that the development of the gallery in the college or the lunch club are starting points for emergent learning and opportunities that would have affective influence throughout the college. Hence, I argue that learning can and does occur in an individual context, but education requires others, human and non-human, in that it develops a collective, as well as an individual, consciousness.

Haraway (2016, p.58) refers to this interactive process as sympoiesis or making-with because she would argue that 'earthlings are never alone'.

*That is the radical implication of sympoiesis. Sympoiesis is a word proper to complex, dynamic, responsive, situated, historical systems. It is a word for worlding-with, in company. Sympoiesis enfolds autopoiesis and generatively unfurls and extends it.*

(ibid)

Therefore, inter-relationships between learning and education, nature and culture and being and becoming are all particularly relevant in this context. These bring into focus the importance of both the aesthetic (affective) and the ecological (connected) in the educative process. However, that influence and shaping in the presence of the other are also an inherently political and ethical enterprise.

To complicate things further, the educative process is also both emergent and full of complexity (Davis & Sumara, 2006; Osberg & Biesta, 2010). It has a creative richness that, by its very nature, is very difficult to quantify. The political imperative often involves some type of accountability process, which all too often, particularly in recent times, has become one that is pre-determined, linear and based on relatively few variables. In that way, accountability becomes contradictory to education as an emergent and complex phenomenon.

The fewer the number of variables, the more that the system can be manipulated in order to show simplistic cause and effect. While driven by

accountability, this culture is ironically more likely to scapegoat responsibility to individuals in the system than the genuinely responsible source of the policies. Hence, those who act out policy (ultimately teachers and university lecturers), it seems to me, more frequently become functionaries as opposed to free-thinking professionals who are able to use their own informed judgements (Ransome, 2011). Accountability procedures are now in a position to determine education processes, pedagogy and assessment and thereby to determine a culture of control. Thus,

*Questions about who we are and who we want to become through education, although of immense importance to ourselves, are always also questions about our relationships with others and about our place in the social fabric. On a wider scale, questions about the content and purpose of education are therefore fundamentally political questions. To leave an answer to these questions to the forces of the market – and we all know how manipulative markets can be in order to secure their own future – deprives us of the opportunity to have a democratic say in the educational renewal of society.*

(Biesta, 2006, p.23)

In that way, nature and culture may appear to be in political conflict, and particularly in the realm of an educational curriculum and associated pedagogy. In this context, by nature I mean the trust in the wisdom, intuition and creativity of the teacher-student relationship bound by a professional and negotiated ethic. By culture, I mean the imposition of political norms, which may initially be driven by a desire for genuine improvement, but which become corrupted by other motives, primarily politico-economic, rather than genuinely of an educational nature.

This, to a certain extent might be illustrated through an event that I experienced. This account of Callum (name changed) illustrates a driving force that I felt strongly while working in schools, particularly when, as a school leader, I had the opportunity and professional imperative, to influence events by opening, and keeping open, spaces for learning.

---

*Callum entered the College at the beginning of year 7, alongside 210 new students. Initially, he appeared to settle well and presented himself as an articulate child, eager to contribute, and with an apparent enthusiasm for learning.*

*However, it soon came to my notice, as the college principal, that reports were being filed that indicated that Callum was displaying anti-social behaviours. He would display anger when he could not have immediate answers to his questions. He would tug at other students' clothes and would become belligerent to staff when they challenged him about his behaviours. He was progressively seen as a disruptive influence and on several occasions teachers suggested that his 'problems' were those that would be likely to lead to sanctions of exclusion, perhaps even on a permanent basis.*

*I was concerned that so early in Callum's secondary school career he was being marked out and damned for the way in which he was reacting to his environment. Always, I had to ask myself in situations of this kind whether this was because of irredeemable behaviours on the part of the student, the intolerance of members of staff, or a mismatch between subject and environment (or a combination of them all). I could not accept that it was the first of these explanations and, therefore, it must be a combination of the other two. However, there needed to be a solution, which, in this case, was unwittingly provided by the intervention of a newly appointed, and in my view inspirational, teacher of music.*

*She explored musical potential in all the students during lesson times and beyond. Callum had been wandering around the music room, very interested in the musical instruments, but, at the same time and unknowingly, irritating most people in the room. The music teacher told him to sit at the piano and stay still. This was an open invitation for him to start playing the piano, which he did with great success and apparent confidence.*

*The music teacher reported this to me the next day, saying, "Did you know that Callum is a musical genius?" Those words resonate with me to this day. Apparently, when he sat at the piano, he played a complete medley of the tunes of a well-known band. He confirmed with the music teacher, when asked whether he had ever had piano lessons, that he had not, but that he had heard all the tunes on the radio the night before. He had reproduced them perfectly on the piano, even adding his own improvisation.*

*From that time, he regularly played the piano in lessons and at breaktimes. Students were very impressed and would fill the*

*room to listen to him. He became the star attraction at concerts and began to take on a leadership role in the College, which encouraged many other students to regard music as 'cool'. He became very popular, and any behaviours that previously they might have found annoying, were now just considered by other students to be the acceptable behaviours of someone with extraordinary talents. This, of course, raised Callum's self-confidence, and his social skills improved accordingly. This became even more apparent when the mathematics teacher reported that he thought that Callum might be considered as similarly gifted in mathematics.*

---

From an aesthoecological perspective, the relationship between nature and culture is far more synchronous, allowing a genuine balance between the two and a consequent reduction in, if not ultimate elimination of, the binary division. It feels as if, in far too many situations, current education practice, perhaps inadvertently, has been travelling down a funnel that filters out the sensitivity (the aesthetic) and unpredictability from the educational experience. Rather than accepting that the richness of education comes through its complexity and its emergent qualities (Osberg & Biesta, 2010), too much of contemporary practice opts for the narrowing of the experience, such that it is linear, prescribed and predictable, and any deviation from that is considered aberrant.

*Despite all the mechanical artifacts that now surround us, the world in which we find ourselves before we set out to calculate and measure it is not an inert or mechanical object but a living field, an open and dynamic landscape subject to its own moods and metamorphoses.*

(Abram, 2017, p.32)

The case of Callum illustrates that education is not a template into which people should fit but is that which emerges by opening up spaces for individuals, teachers and students alike, to explore the opportunities that arise. Within this, there is chaos and complexity, but the valuable nature of that situation should itself be inherent in the culture (Descola, 2014). This relationship between nature and culture represents the state of flux between meaningfulness and expression and between idiosyncratic form and social structures. In this way, it acts out the tensions between sameness and difference, and unity and diversity. An aesthoecological context thereby allows an insight into the

patterns, temporality and resonances of experience, myriad ways of being in the environment – a behavioural ecology.

Inherent in this behavioural ecology, teachers

*experience every day the randomness and chaos that characterize their professional lives and how it [sic] impacts the decisions they take. Nevertheless, schools remain organized around a conception of time privileging predictability and stability, assuming that it can be controlled and managed. Educational temporalities should rather be conceived through order and disorder. They require invariance and consistency as much as they display the critical influence of random interactions or fluctuations.*

(Alhadeff-Jones, 2018, p.27)

This complexity, that is often underplayed when considering educational organisation, is inherent in the rhythmicity of autopoietic organisms and should be valued as a key characteristic of education. When recognised and worked with, it provides a richness to the spaces and places within which education can take place.

#### **4.4 Museums and galleries cohabiting with educational emergence**

Within the context of aesthoecology, I propose that museums and galleries, for example, provide a diversity of spaces within which the emergence of new thinking and imaginative play can be exercised. I stress that museums and galleries, and I use the words interchangeably, are not the only places that offer the opportunities that are highlighted in this section. Traditionally, they are places within which material collections and artefacts can inspire personal and collective learning opportunities (Hood & Kraehe, 2017). Seen as liminal zones, these spaces are able to provide a network of provision that might be thought of as part of a museum ecology (Wakkary & Evernden, 2005). The very essence of this ecology is that it is set within an aesthetic environment, and that combination, as theorised previously, is rich in emergent qualities.

A similar sort of environment was envisaged in the gallery set up within the college that might be interpreted as part of a museum ecology – an environment that did not have the restriction of a conventional classroom. It could be

experimental. It could work with many types of objects as equals and value the aesthetic and ecology of the space that it created. It was hoped that this experimenting could be adopted across other areas of the college as appropriate.

Significantly, these opportunities are not one-off events, but provide a place for visiting and revisiting, entering and re-entering creative liminal zones. Through experiential connection, and active involvement, artefacts, exhibits, pictures, sculptures or just things might engage all the senses, individually or in a synaesthetic experience, which can initiate imaginative journeys and educational landscapes (MacCrae et al., 2018). In this way, although one-off visits to museums are excellent as a stimulus for learning (Monk, 2013), repeat visits allow for the building of a connected architecture of emergent understanding. These are lifelong opportunities for education, a human right, in which education plays a full role in personal growth and emancipation. Museum artefacts, unlike many other more conventional educational situations, can give rise to unplanned responses, which can alter perspectives and produce transformational moments, eliciting behaviour with meaning (Cohen et al., 2011; Hood & Kraehe, 2017). Placing oneself in unfamiliar settings, or with unfamiliar objects, as in a journey, offers opportunities for perceiving things differently.

Hood and Kraehe (2017) refer, for example, to experiencing art in a museum by 'getting lost' (p.37). They cite the work of Kai-Kee (2015) who recommends the idea of wandering until something affects your normal disposition. This idea of wandering and/or wondering raises questions and encourages speculation of the materiality of artefacts and works of art, which leads Hood and Kraehe (2017, p.37) to claim that 'New materialist art inquiries engender new educational insights precisely because they are disorientating.' This was exactly the sort of atmosphere that we sought to create in the college's gallery, to engender 'a field where imaginative and emergent forms of inquiry can flourish in different ways for different contexts, with insights for both theory and practice' (Hood & Kraehe, 2017, p.38).

This space for transformation is particularly relevant in museum environments. Objects or works of art and natural perception in some way are brought together, while still having a way of distinguishing between them. In these

museum artefacts, we are able to perceive the visual dynamics with and through actual form (Massumi, 2013). Consequently, the perception of an object is uncannily related to a semblance of the object. Massumi (2013) talks of the thinking-feeling of an object: 'There is a thinking of perception in perception, in the immediacy of its occurrence, as it is felt – a thinking-feeling, in visual form' (Massumi, 2013, p.44). This suggests that art and everyday experience are in continuity, a sort of rhythmic resonance with one another, and that there is an element of art in every experience.

Under everyday circumstances, we allow the utility effect to mask the affectivity of the perceptual experience and thereby lose the vitality of the senses. We filter out the aesthetic intensity and accept the familiar. Self-reflexivity is diminished. Hence, in looking at familiar objects,

*The sense of relational aliveness disappears into the living. The 'uncanniness' of the way in which the object appears as the object it is – as if doubled itself with the aura of its own qualitative nature – disappears into a chain of action. We live out the perception, rather than living it in. We forget that a chair, for example, isn't just a chair. In addition to being one it looks like one. The 'likeness' of an object to itself, its immediate doubleness, gives every perception a hint of déjà vu. That's the uncanniness. The 'likeness' of things is a qualitative fringe, or aura to use a totally unpopular word, that betokens a moreness to life. It stands in the perception for perception's passing. It is the feeling in this chair that life goes on. It presents, in the object, the object's relation to the flow not of action but of life itself, its dynamic unfolding, the fact that it is always passing through its own potential.*

(Massumi, 2013, p.45)

The educational role of a museum or gallery is complex and comes alive through the interaction of culture and, when appropriate, a pre-defined pedagogy. Critical pedagogy is always concerned with the relationships between power, language, imagery, social relations and ethics, and museums are able to 'provide students with a range of identities and human possibilities that emerge among, within and between different zones of culture' (Hooper Greenhill, 1994, p.22).

In an aesthoecological sense, museums blend the temporal arrangement of material things and bring the past, present and future into a series of foci from which the passage of time is somehow altered and framed differently from a



personal perspective (e.g. Witcomb, 2013). To open up spaces that allow thinking and perceiving differently is the challenge that is faced by the museum education professional. To open the window to drive critical thinking and informed debate and to foster 'a visitor's developing identity as someone capable of and disposed to take part in such debate' (Felton & Kuhn, 2007) is one of the challenges worth pursuing. This is recognised in the work of the Museums Association (2013), in which education, inclusivity and democracy are accepted as the key purposes of museums in the 21st century (Taylor, M., 2014).

Our education systems have always been predicated on an understanding of the past and an idea that the future is almost entirely predictable and controllable. However, even when there are clear and evidenced predictions of the future, e.g. global warming, our cultural norms and the neo-liberalism built into our education and political systems refuse to adapt and radically change to accommodate potential disasters. It is as if we are frozen by our educational inheritance. We can see the disasters approaching but are unable to act holistically enough to avoid their potential impact. It is, therefore, relevant to explore how the issues that are facing us today, those hyperobjects that Morton (2013) warns us of and I describe in detail in Chapter 5, might be better anticipated. Aesthoecology has a role to play in this. 'The task before us today is not that of reproducing the past but asking how we should respond educationally to the questions and challenges that are facing us today' (Biesta, 2006, p.100). Perhaps more significantly, it is the challenges facing us into the future that are important, and the question is in what way education can create the spaces to ask those crucial anticipatory questions.

I propose that museums and galleries, as an example of the essential diversity of education, should be a part of an educational interconnectedness, an education ecology, which need not be necessarily predicated upon a series of physical spaces. The advent of the digital age is having a profound effect on all aspects of life and opens up spaces in an exponential number of ways. Barr (2005) and Wakkary & Evernden (2005) are critical of the way in which this medium might be used by staff in museums, by suggesting that many seem to assume that the only use of technology reference collections online. Barr (2005)

suggests that this supports the old idea that learning is about passing on facts and that it is the curator's job to deliver them.

There is already an increasingly rapid growth of participation in discussion and debate, by the public and museum professionals alike, through websites and social media (e.g. Facebook, LinkedIn, museum websites). This is another facet of the interactive components of learning which contribute to the notion of a museum ecology.

The advantages of museums and galleries is that they are not age specific and that adults, alongside children and young people might benefit from the collections, artefacts, artworks and dormant imaginings that might be conjured up. In this way, people of all ages might learn together and, in a sense, there might be some element of role reversal, particularly in a post-industrial knowledge economy in which adults are expected to be 'flexible, adaptable and responsive to change' and 'increasingly responsible for making their place and role in the world on an ongoing basis' (Facer, 2011, p.32). In this sense, adults could aspire to the characteristics of childhood such as playfulness (Monk, 2013; Shen et al., 2014; Van Leeuwen & Westwood, 2008; Yarnal & Qian, 2012). These childhood qualities were juxtaposed against the traditional traits of adulthood such as stability, experience and expertise. In the digital era, these standard models of age-related educational proficiency are somewhat disrupted. This disruption opens up yet further spaces for exploration of ways of being and becoming, which art galleries and museums are particularly well placed to develop.

These opportunities for connectedness, for disruption, for subversion and for the aesthetic, are already to be found in contemporary museums and galleries, even if it is not immediately obvious. Museums and galleries capture and exemplify, in so many ways, the essence of aesthoecology as I see it now and into the future. In addition to looking at schools as the very centres of wisdom and education provision, developments and ideas from the museum world might be usefully mined to transfer, to disturb, disrupt and excite thinking in schools. This interconnectivity could of course extend to any one of a number of places and spaces for education. I include zoos, botanical gardens, nature reserves,

libraries and activity centres. And why not the architectural aesthoecology of streets, parks and buildings?

Ecological terms for the stimuli that excite disruption might be disturbance or perturbation (Loi & Dillon, 2006), which are perfectly good ways of expressing opportunities for change in education contexts. Often seen as an equivalent term in these contexts, but worryingly much more controlling, is intervention. This is a common strategy in education, in which stimuli for change are deliberate and 'undertaken by one or more participants to trigger a particular outcome' (Loi and Dillon, 2006, p.365).

Thus, intervention as action, although I prefer the more radical ecological terms of 'disturbance' and 'perturbation', must take place through the creation of physical and metaphysical spaces within which change can emerge. Loi and Dillon (2006) claim that

*If we want to develop spaces that people can change, design, experiment with, and use in a variety of ways, we have to intervene in the environment in a purposeful, designed way. Creativity, like any other human activity, is situationally dependent. Formal educational situations may well promote intradisciplinary creative abilities. However, if we want inter- and multi-disciplinary creative abilities, we have to change the environment, the relationships between people and resources. Although this may seem self-evident, a systems view gives us a clearer understanding of the environment and enables us to better target interventions.*

(Loi & Dillon, 2006, pp.366-367)

Loi and Dillon (2006, pp. 366-367), in the section above, refer to intervening 'in the environment in a purposeful, designed way'. I saw this in the development of the lunch club at school. The environment did not just happen. It had to be designed in a particular way and it arose from the thinking of the teachers. They could see potential in the idea of a lunch club by enriching more conventional classrooms, by developing relationships between people of all generations, by creating educational spaces and by activities that involved people interacting with their environment. What they did not do was to determine the outcomes beforehand. Instead, they became intimately involved in the changes that emerged through their interventions.

I need only scan the *Museums Journal* of January 2019 to glean a host of material and philosophies that I would have happily transferred to the curriculum and pedagogy of schools that I worked in. For example, one small article reports on the role that arts and culture can play in health and social care settings. According to the report, one quarter of the museums in the UK are targeting dementia sufferers, and longitudinal research shows that there is a correlation between regular museum attendance and lower incidence of dementia (ibid, p.5). Another article, 'Arts can play a major role in tackling social isolation', reliably claims that 'engagement with the arts, museums and creative practice helps people become more connected' (ibid, p.11). Richard Sandell of Leicester University explains that the project using Calke Abbey as an example transforms every aspect of a visitor's experience, including the rearrangement of furniture in the café to make it more social. This sort of example is transferrable to many other settings where awareness of the materiality of our immediate surroundings can make an affective difference to those present and their interaction with the environment.

In tackling urgent issues of the day, museums can play a major role. Another article, 'Sector must play its part in tackling climate breakdown' (ibid, p.12), starts by asserting that

*A worldwide consensus is emerging that we can no longer afford to wait for governments to lead the way on climate action. The extreme weather events of 2018, bolstered by the publication of Intergovernmental Panel on Climate Change (IPCC) scientific report estimating that there are about 12 years left to prevent a catastrophic rise in global temperatures, have created a new sense of urgency and impetus about the issue at grassroots level, even while governments worldwide remain in a state of paralysis or denial.*

This is an excellent example of ethical and democratic action by taking control of important global issues and making them local. Charlotte Connelly of the Polar Museum says, 'I want climate change to be seen as a cultural issue and not just something that should be dealt with by science museums', and a key strategy is to connect it directly to people's daily lives as opposed to framing climate breakdown as 'a huge yet distant issue that's happening somewhere else' (ibid, p.13). Bridget McKenzie, the founder of Climate Museum UK, believes that museums should position themselves to play a pivotal role in building resilience and helping communities adapt to the realities to come –

such as building tolerance to deal with increased migration. She refers to the sense of grief at the inaction of government and the ongoing destruction of the environment and has adopted the term solastalgia for this emotion, but, in contrast, encourages a culture of soliphilia – a sense of love, wonder and responsibility for the planet (ibid, p.13).

Further stories and articles concern themselves with the recognition now being afforded to female scientists in cultural spaces (ibid, p.13), to social inclusion programmes by the leader of LGBTQ tours around a Birmingham museum (ibid, p.26) to a review of the Site Gallery in Sheffield in which the director talks about how she excites people about art: 'I think a lot about kids and families who feel disengaged from the arts. Giving people the confidence to come into our gallery is a really important start' (ibid, pp.32-33).

These examples relate to one-off events and can only provide a snapshot of what is possible in the spaces that museums and galleries provide. However, the totality of the experience of places such as these is more difficult to assess because they are very individual. These experiences are undeniably ecological in that they focus on place and time and aesthetic because the best museums and galleries rely on a synaesthesia of sensory experiences and an intimate involvement, not just a linear process of informing (Salazar, 2011). In this combination, they exhibit all the characteristics of the principles of aesthoecology. Dewey (1934) believes that every person is capable of being an artist and living an artful life of social interaction. In this, he believes that art is transformative and that these transformative experiences occur through the use of intuition and developing new ways of seeing. This experience represents a rupture from the ordinary.

This is so important within the notion of aesthoecology and within profound educational experiences, should be one of the defining purposes of the museum or gallery. It is only through this rupture, that new ways of seeing come into view. In *Gallery Education by Agreement, or 'Establishing Hazardous Bodies'* (Furstenberg & Plegge, 2009, p.55), there is an account of eight hearing-impaired students who visited a gallery and, in the visiting, transformed the space. This came about because their visit was entirely without speech, but they had to communicate with one another their feelings and impressions of the

artefacts in the gallery. They did this with crepe paper, crayons, ribbon and magic markers:

*Bit by bit a network of relationships developed that covered the entire room, in which artworks were set in relation to one another through connecting lines. Tape, the objects the students had brought with them, magic markers, written words, the paper speech bubbles commenting on the art works, and the previously taped lines of connection assumed the function of 'vehicles'. They were supposed to serve as aids for the students in confronting something new and possibly unknown and, most importantly, in being able to establish a relationship with it.*

(Furstenberg & Plegge, 2009, p.55)

The facilitators to this group of students noted three interesting effects that this half-day session had in the gallery. Firstly, the unconventional ways in which the students engaged with the artefacts and communicated with each other caused concerns, disruption and perceived security risks for the smooth running of the gallery. Secondly, the white lines on the floor drawn to foster communication between the artworks caused confusion for others in the gallery who were guided by the lines. Other users of the gallery

*steered, attracted, redirected, and confused not only our steps and way of looking at the exhibition as a project group but also those of the visitors and guards ... Our tape lines were a provocation, in that they partially upset the rules and routines.*

(Furstenburg & Plegge, 2009, p.57)

Thirdly, because the markers and speech bubbles were freely available, other visitors were drawn into the exercise and to comment freely on the exhibits.

The conclusion drawn from this session was that it highlighted the borders between normal and abnormal, between what is appropriate behaviour and what is temporarily tolerated, and between users who are considered normative users and those who cause some disruption. These dilemmas of institutional norms and challenges are well known to all those who use schools and who challenge the status quo. It might be argued that galleries and schools should be encouraged to do just that in the interests of educational freedom, but there are counter arguments when the question is asked: Whose freedom?

The gallery educators recorded that what they achieved for a brief time was ‘a crisis within the museum space’, which they considered to be a ‘kind of experience that reveals possibilities of change and helps us to shake up our notions of the things we take for granted’ (Furstenburg & Plegge, 2009, p.61).

I recall being in the Hayward Gallery in London in 2012, attending the ‘Art of Change’ exhibition, *New Directions from China*, ‘which presents ground-breaking Chinese art that refuses to sit still’:

*Each of the artists presents works that change their appearance over time or which are volatile or unpredictable in some way. A person ‘magically floats’ above the floor, sculptures are wilfully tossed up and down, and visitors can listen to the sound of 1000 silkworms. The exhibition itself changes as performances are enacted with various works during the course of each day.*

(Hayward Gallery, Exhibition Catalogue, 2012)

The exhibition emphasised that change, and the understanding that everything is subject to change, is significant in Eastern philosophy. Consequently, in ways that are very similar to the concept of aesthoecology, the exhibits dealt with ‘transformation, instability and impermanence, looking at how these themes are conveyed through action or materials’ (ibid). When I was at the Hayward Gallery, I remember feeling that someone was following me, and indeed performance artists were doing so, as they were following other members of the public, but when I looked around they would freeze as a living sculpture. This challenged the individual aesthetic through sensory confusion, and my sense of space and place and, therefore, my ecology.

There is a classic example of this challenge in the gallery work of Trisha Brown, documented by Campaner (2009, pp. 232-233). Brown’s piece, *Floor of the Forest and Accumulation*, involved 12 dancers performing a dance every hour on the hour. The entire space was taken up by the dancers and, therefore, visitors had to squeeze into the room, taking care not to come into contact with either the dancers or other visitors. The visitors had no prior knowledge of the dance being performed, and they were admitted into the room one at a time and had to find space to be. There was a gallery educator present, but she only talked to the visitors as a group after their experience in the room. A discussion was held, and the experience was analysed from different perspectives. This

revolved around abandonment – the visitor felt very alone entering the new space; strangeness – not feeling part of the piece; awkwardness – causing irritation because of the closeness between object and visitor; and, from the gallery educator, a particularly interesting viewpoint:

*I saw the performance a great deal ... For me the dance was like an appointment, a date that lent a rhythm to my full and chaotic day. I knew the movers, their movements and poses, and when I was in the space, I really did feel like part of the action, but more on a mental level than a physical one. The music permeated my memory and was recorded there. For me the performance was a kind of ritual that continuously gained new significance through discussions with visitors.*

(Campaner, 2009, p.233)

There is much in this installation to consider, but it is clear that it needs experiencing first hand. The aesthetic involved, from the perspective of each of the participants, is particularly interesting, and the ecology of the space and the interactions are very relevant. From this piece, one gets a good idea of the way in which the aesthetic and the ecology are intertwined, which illustrates very well the symbiotic connectivity between the two and the way in which the rhythm mediates the inter-connectivity in the case of each of the participants.

The feelings engendered in the performance cited above bring to mind those anxieties and sensations that must be frequently felt by students in schools on a day-to-day basis – strangeness, awkwardness – and in a sense that can be brought to the fore by metaphorical performance of the type also described in the Hayward Gallery.

These examples of disruption, challenge, rhythmicity and personal and political intervention are important in the creation of new ways of seeing and knowing. By way of illustration, I refer to an opportunity that arose when I was a college principal to incorporate a provision for secondary-aged children with ASD within the college. The staff in the college responsible for special educational needs were imaginative, insightful, creative and sensitive to the needs of all young people and insisted that this provision should be incorporated at the heart of the college and not in a separate building (Brede et al., 2017; Humphrey & Symes, 2011; Lindsay et al., 2014). In the physical centre of the college, was already a learning resource centre and library. The new provision for students with ASD



would be situated next to that area and adjacent to an experimental hub for a local authority co-located team, consisting of school nurse, social workers, counsellors and psychologists, and to include a desk for the local community police officer.

Creating spaces and places for a variety of students who would conventionally be seen as different and recognising and valuing that difference are an important part of the work of an education establishment. That acceptance that difference is a bonus, and the conception of all behaviours being on a spectrum rather than falling within predefined categories, should be valued. The creation of safe and productive spaces and places (Tuan, 1977) and sensitivity to them are an important element of education.

This approach is progressively more common in museums and galleries, which are able to experiment much more with people and spaces. The interaction with things and people in different ways and different circumstances is designed to challenge the status quo and normative ways of seeing (e.g. Foreman-Peck & Travers, 2013; Loi & Dillon, 2006; Milovanov et al., 2017). This is fundamental to any notion of aesthoecology in that challenging the senses, raising sensitivities and appreciating temporal dimensions of space and place make the opportunities for affective education so much greater. I explore these aspects of aesthoecology in more detail in later chapters.

#### **4.4 The science of art and the art of science: breaking down the divisions and seeing beyond the connections**

Examples of educational significance in museums and galleries may be seen in isolation – as separate events that are unconnected. However, if these experiences are to be truly educational, there is a requirement for connectivity. This connectivity runs through the experiences and through all the materiality and non-materiality connected with the event (Dolphijn & van der Tuin, 2012) and then beyond. In aesthoecology, this connectivity, the ecology, is fundamental, but it is not just linear connectivity, straight lines joining nodes of similarity, which allows us to see things more clearly (Brady, 2016). It is far more complex (Braidotti & Bignall, 2019) and involves a web or, more descriptively, a plasma of connectivity, which is vibrant, rhythmic and sensory –

a cartography of becoming (Masny, 2013). This plasma is multi-dimensional, with integral elements of space and time. Events that happen are in spatio-temporal contexts (Tuan, 1977), and the emanating, emerging experiences are carried forward and back in order that sense may be made of them. They form part of our education landscape. In entering the liminal zone (Conroy, 2004; Horvath et al., 2018), there is time for pause, but it may only be a lay-by, an assimilatory and temporary parking space. More romantically, the analogy of the stream, with its quiet eddies and backwaters, might accord with our deeper nature; but we create our nature, we are nature, and we have to a great extent abandoned the connectivity of water for that of tarmac and the rubbish tip. Education has many opportunities to recognise the need for balance and to redress the balance (Bonnett, 2004; Louv, 2012).

Science has given us so many advantages, but in doing so has often separated itself from a holistic view of existence. Consequently, art has been forced to do so as well, which is just one, albeit important, example of how division has manifested itself through society and in the curriculum of education organisations. This is often heard in the arguments of nature-culture divisions discussed earlier and in particular ways of interpreting the world. My arguments for aesthetic and ecological symbiosis represent a unified and holistic perspective, which encourages a vision of science through art and the arts through science. Similar arguments may be made for any other curriculum disciplines and their cross integration. My experience in schools is that explaining science through the arts and vice versa has many benefits (see e.g. Beane, 1995; Cremin et al., 2015; Green et al., 2018; Hendrix et al., 2012). To suggest that the brain works in one dimension rather than the other starts with a deficit model, which disadvantages children in their confidence and development (McGilchrist, 2012). Common to art and science is the aesthetic of patterns (Stewart & Golubitsky, 1992), and this phenomenon is implicit in much of the theory I discuss in later chapters, for example that of symmetry and symmetry breaking (Chapter 6.3).

The Francis Crick Institute in London is dedicated to understanding the fundamental biology underlying health and disease and is the biggest biomedical research facility under a single roof in Europe. From its inauguration

in 2017, it has recognised the importance of the collaboration between art and science, and over the past two years has illustrated this by developing collaborative projects with artists. Three unique commissions were developed through conversations and close collaborations with Crick researchers:

*A myriad of intriguing patterns exist [sic] throughout the natural world, many of which are visible to the naked eye. For biomedical researchers at the Crick, however, the patterns they seek are minute cellular and molecular forms. They are also extraordinarily dynamic: they grow, shrink, move, connect, break and rearrange.*

*'Deconstructing Patterns' provides a glimpse into three intricate developmental patterns studied at the Crick, each one introduced by a unique artwork. In this context, deconstruction is a fundamentally creative process. By taking patterns apart, both the artists and scientists are seeking new insights into the puzzle of how the complexity of the human body arises.*

[www.crick.ac.uk/deconstructingpatterns](http://www.crick.ac.uk/deconstructingpatterns))

The three resulting artworks offer alternative ways of exploring and describing the microscopic patterns studied at the Crick. Not only does this assist scientists in reconstructing ideas of cell biology but is also an effective way of communicating their work to other scientists and to the community at large. Metaphor is obviously found to be a compulsive and productive tool for artists and scientists alike. The collaborations took the form of a poetry and soundscape (*Infinite Instructions*), a sculpture (*Transforming Connections*) and a film (*Breaking Symmetry*).

Similar advantages in combining the arts and sciences have been found at the Wellcome Collection in London, a museum dedicated to the history of medicine. It explains on its website that

*To many, science embodies the rational and analytical end of human experience, while art comes from the empathic and expressive. Science can prove truths to us, while art can only make them feel them.*

*These differences are compounded as science becomes responsible for the official narrative of our lives, through medicine and genetics, while contemporary art retains a mystical 'outsider' status, both in its intellectual obscurity and the inflated prices of the international art market. Nevertheless, where science meets art and the two work together, the result can be extraordinarily productive, as horizons are broadened and gaps in our understanding of both are filled.*

The website illustrates this by reference to a number of practices of art that help to unravel and communicate further understanding of anatomy and physiology, for example, the construction of 3D models that detail delicate aspects of the human structure, blown-glass sculptures of viruses and photographic images taken through an electron microscope. Science and art

*both rely on observation and synthesis: taking what is seen and creating something new from it. Our society could hardly exist without either, but when they come together our culture is enriched, sometimes in unexpected ways.*

(Kingston, 2015, [www.wellcomecollection.org](http://www.wellcomecollection.org))

There are, increasingly, examples of curriculum developments that recognise the value of a greater integration between science and art (Chappell et al., 2019) and, at a time when the arts are being marginalised in mainstream schooling, this is a welcome development. Much has been said about the importance of arts in schools, but all too frequently they have been seen as something separate from other subject areas. A distinguished report was produced in 1982, researched by Ken Robinson, *The Arts in Schools – Principles, Practices and Provision*, which began to argue for the mutuality of the arts and sciences:

*We want to see a wider recognition of what the different ways of knowing, in arts and sciences, for example, have in common. Discovery in science is not 'a strictly logical performance' any more than work in the arts is simply the expression of feeling. The scientist relies as much on intuition and creative insight in parts of his [sic] work as the artist relies on discipline and application to detail in parts of his. Indeed, in talking about artists and scientists we are not necessarily talking about different people at all but about the exercise of different capabilities existing within the same person. It is one of the tragedies of contemporary education that the relationships between these capabilities should have become so neglected.*

(Robinson, 1982, p.24)

The work of Ken Robinson was significant in highlighting the importance of the arts but perhaps more importantly gave rise to the burgeoning of research in the area of creativity, particularly in light of the publication of the report of the 1999 National Advisory Committee on Creative and Cultural Education (NACCCE).

This distinguishes between two important features of creative education – creative teaching and teaching for creativity and Jeffrey and Craft (2004) argue for the integration of the two. In that way, these features would be as applicable to the arts as to the sciences, and indeed to any other curriculum area. Equally significantly, researchers such as Anna Craft, Pam Burnard, Teresa Cremin and Kerry Chappell (see, e.g., Burnard et al., 2006; Craft, 2015) developed the notion of possibility thinking, which in its characteristics and its potential is related to current studies on anticipation and social change (Craft & Chappell, 2014).

I would argue that breaking down the divisions between the sciences and the arts is a valuable way of looking at future pedagogical developments. But it is more than that. It is a building up of the connections between the two and each benefiting from the other. As in aesthocoecology, there is a richness in the symbiotic relationship enhanced by a mutual rhythmicity, or a synchronicity. When reaction becomes action is when the greatest creativity emerges. This is captured by a quotation from Thomas Berry on the website of The Center for Education, Imagination and the Natural World ([www.beholdnature.org](http://www.beholdnature.org)):

*There is a different way of knowing. The Center for Education, Imagination and the Natural World is about this other mode of consciousness. What you are doing at the Center is fundamental and deeply important at this time in history. The children of the twenty-first century will determine the fate of this planet. The twentieth century was a century of death and destruction. The twenty-first must be a century of life. The Center is giving children integral experiences, validating experiences to give immediacy to the natural world and in the course of their own human development as an emerging consciousness in our time.*

(Berry, [www.beholdnature.org](http://www.beholdnature.org))

Contemporary studies relating to the arts and the sciences have come about with the development from Science, Technology, Engineering and Maths (STEM) subjects to include arts, to form the acronym STEAM. Work by Chappell et al. (2019), for example, is of particular relevance in that it uses a new materialist and transdisciplinary perspective to the investigation, which asks questions ‘beyond disciplines and (particularly in educational contexts) fuelled by students’ and teachers’ curiosity. It is in response to curious questions in education that transdisciplinarity emerges’ (Chappell et al., 2019,

p.6). This way of destabilising, reconfiguring and shifting boundaries (Barad, 2003, p.818) reflects the entanglements also emphasised in notions of aesthoecology.

Further examples of the way in which STEM has adopted the arts in order to foster innovation and transdisciplinarity are provided by Segarra et al (2018). This paper describes the ways in which the arts, in the broadest of senses, have been utilised in the recruitment and training of scientists.

*When we think of integrating arts and science, the most obvious art form that comes to mind is the visual arts. After all, most scientists have had to generate diagrams to communicate their science effectively. At the same time, performance arts such as dance and theatre also lend themselves to integration into science education and training.*

(Segarra et al., 2018, p.1)

This appears to maintain a science-led integration of the subjects, but the pedagogy and curriculum extend further and deeper, exploring innovative ways in which the disciplines can coalesce for mutual benefit.

*Far from a common view of science as an accumulation of formal laws, the dynamic exploration of natural phenomena, for example, is enacting conditions of possibilities, interruptions, interpretations, and play(ing) with variable relations. It is the fascination with phenomena (like the presence and absence of light, sound and motion) that motivates both metaphoric and explanatory response. The question 'what if?' prods scientist and dramatist towards creative exploration and interpretation of experiential sensual world(s) real and imagined.*

(Fels & Meyer, 1997, p.75)

Further illustration of this comes, for example, from an exhibition at the Natural History Museum, London, called the Colour and Vision Exhibition ([www.nhm.ac.uk/discover/art-science-reflections-colour-vision](http://www.nhm.ac.uk/discover/art-science-reflections-colour-vision)). Two scientists worked with two artists to investigate the colour red from the perspective of both science and art.

The scientists were specialist researchers, one on the evolution of the eye in arthropods and the other on the evolution of colour in marine invertebrates. One of the artists worked with light installations, having a particular interest in the interaction between light and colour. The other had been born with the condition

of achromatism which meant he had no colour vision at all. However, with engineers he had created an antenna that was implanted in his skull, allowing him to hear colours even beyond the normal human visual spectrum.

The result of the research was a series of videos that illustrated an interesting melding of the sciences and the arts. They explored the meaning of red and its impact on emotions – its affectivity.

Similar inter-disciplinary research was exhibited at a lecture demonstration at the Siobhan Davies Dance studios in London ([www.siobhandavies.com](http://www.siobhandavies.com)) in 2016. A cognitive neuroscientist, a social psychologist and a choreographer investigated the way in which groups work together, the relationship this has to synchrony and the effect it has on performers and perceivers.

What these examples of collaboration show is that science and art working co-operatively may find solutions to issues of concern in ways that working independently would not enable them to do. If research can illustrate this, there must also be significance for education and the curriculum.

These types of pedagogical approach encourage the embodiment of ideas by physically interacting with the environment, opening up participatory spaces and engaging with bodies, voices, memories and imaginations (Fels & Meyer, 1997). A similar example of the use and appreciation of materials incorporates sculpture in biochemistry (Gurnon et al, 2013). This reports on a contemporary and angular piece of metal sculpture produced by art students but incorporating the thoughts and ideas of science students. One art student asked how the scientists were able to calculate the angles in a protein, and biochemistry students were encouraged to discuss protein structure and dynamics. Discussions led to visual strategies to convey information and the ways in which molecular structures can be understood further by the arts and sciences in close collaboration.

The influences of posthumanism and new materialism are beginning to reach into mainstream education (e.g. Chappell, 2018), which may open up pedagogical spaces for new ways of seeing the curriculum. This approach has been adopted by education centres such as Schumacher College in Dartington, Devon, which has advocated a Gaian understanding of the world and adopted

such a curriculum for its MSc course in Holistic Science. There are other notable schools and colleges that have taken a holistic, affective and aesthetic view of their ways of working, which correspond closely to the notion of an aesthoecology, but this is represented in relatively few educational establishments. My argument is that these characteristics of aesthoecology should be apparent much more widely into the future.

## 4.5 Summary

In the examples I have referred to in museums and galleries, and those in which transdisciplinarity through art and science can be evidenced, the richness of connectivity becomes apparent. This is inherent in the theories I propose of aesthoecology. It is more than bodies of knowledge or existing pedagogical practice; it is a recognition of that which might be and the spaces which might be created for that to come alive. The aesthetic represents the aliveness to the new and the ecology the spaces within which the new might appear.

This accords with an aesthoecological understanding of education. It has an impermanence to it because the very nature of education is an act of being in transition, and that transition is greatly enhanced when it exists across, within and beyond our normal conventions of subject divisions. This notion of continuous change and the conditions required to elicit it are well illustrated by the Reggio Emilia approach in Italy, which has many elements of aesthoecology in its philosophy:

*When one observes children and adults in the schools of Reggio Emilia, one perceives that there is a particular connection between time and space and that the environment truly works. The consideration of the children's own needs and rhythms shapes the arrangement of space and the physical environment, and, in turn, the time at disposal allows for the use and enjoyment, at a child's pace, of such carefully thought out space.*

(Edwards et al., 1998, p.169)

It is these sorts of elements – connection, time, space, environment, rhythm – that are explored further in subsequent chapters of this thesis, and all of which appear as central tenets of both aesthetics and ecology.



# Chapter 5 – Aesthetics and Ecology: Separate Entities yet in Affinity

*We shall not cease from exploration  
And the end of all our exploring  
Will be to arrive where we started  
And know the place for the first time.*

(T. S. Eliot, *Four Quartets*)

## 5.1 Introduction

I contend that an understanding of aesthetics and ecology, and the relationship between them, has important implications. At its root may lie some exposure to paradoxical questions of the culture of nature and the nature of culture, an examination of which penetrates to the heart of many socio-biological questions (e.g. Blumenthal, 1936; Delius, 1991; Giblett, 2008; Pretty & Pilgrim, 2008; Reyes-Garcia et al., 2016) and, not least, to some vexed interpretations of the meaning of education particularly when considered within an understanding of posthumanism. It is consequently what an appreciation of the relationships between aesthetics and ecology brings to the greater impact of education and education systems that is the focus of this thesis.

Throughout my time as a teacher and for much of that time as a school and community college leader, I progressively developed the view that, both somatically and intellectually, aesthetics and ecology could be argued to be at the heart of the educational process – aesthetics because of the sensitivity and sometimes sheer beauty of developing a greater understanding of the world in which we live, and its meaning; ecology because of the complex contexts in which we acquire this understanding. Both, it seemed to me, were essential ingredients for this process that we understand to be education. Education is, at one and the same time, both affective and connected.

Furthermore, when in close relationship with and energised by the organic nature of their own synchronous rhythmicity, I contend that aesthetics and ecology may be considered, at their optimal, to be fundamental to what might be considered as an inherent beauty of education. This beauty is usefully

considered as the synaesthetic interplay between affectivity and connectivity, dynamically mediated by an inherent rhythmicity.

I define affectivity as an acute and variously delicate sensitivity to the surroundings within which we find ourselves. This affective sensitivity is influential in determining our actions and has ethical, emotional and empathetic dimensions. This sensitivity allows us to determine both the beauty, or the lack of it, in any given situation in which, I contend, beauty has a rhythmic dimension to it and simultaneously a discordant effect. We move between the two, the beautiful and the ugly of our environment, recognising that the contrast between the two acts as a guiding principle. This may be represented by our appreciation of landscape, of architecture, of other organisms or multifarious material artefacts. We are inextricably connected to the animate and material world (see Bennett, 2010; Braidotti, 2013; Braidotti & Bignall, 2019; Haraway, 2008; Morton, 2007, 2013) and this, in various spatial and temporal dimensions, affects our ways of being and our sensitivities to becoming.

This provides a connectivity of existence. The more we recognise that nothing exists in isolation, the more that we can understand the emergence and the complexity of our developing cognitive and somatic landscape. All living systems are anticipatory systems (Rosen, 2012; Poli, 2017), in which we see the world as meaningful and within which there are possibilities for action. This is an inherent characteristic of education; it is not following the path of an-other but interacting with the other that allows an educational landscape to emerge. So, rather than the world being out there waiting to be discovered, it is continuously in construction by this very interaction. Connectivity possesses a rhythmicity to its becoming.

I argue in this thesis that this dynamic relationship lies at the heart of the concept of aesthoecology, which plays a vital role in an understanding of the education imperative. In this chapter, I examine the individual components of aesthoecology (aesthetics and ecology), and consider the role of rhythmicity in their dynamic, while bringing them to bear on the education imperative.

## 5.2 The trilobe synoptique

This rhythmic interplay between our affective self and our connective self has a synaesthetic quality – subtle blending from which emerge new understandings, which may be consolidated or altered but can never be lost, and this synthesis might be usefully understood by reference to the notion of a trilobe synoptique. The inherent rhythmicity may be related to that which gives us foresight or the capacity to affectively anticipate that which is to come.

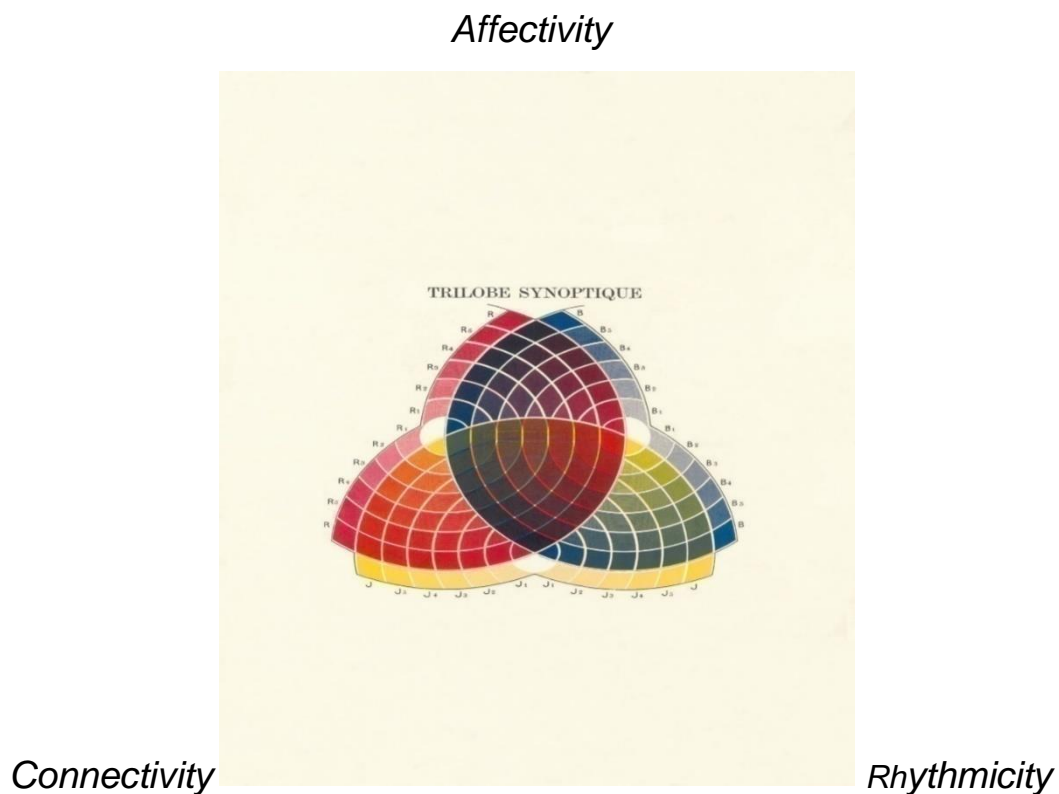


Figure 9: 'Trilobe synoptique' by Charles Lacouture [Copyright approved from The Pattern Book Company].

The trilobe synoptique is a visual representation of those elements that I contend are the key features of aesthoecology. Those elements are affectivity (inherent in the aesthetic), connectivity (inherent in ecology) and rhythmicity. The importance of aesthetics and ecology is that they exist in a relationship with each other that contributes more to our perception of the world than if they were considered to be free-standing elements. The way in which they interact, through a symbiotic relationship, sets up opportunities for the new to emerge in ways that they may not have considered before. They produce a dynamic, the

oscillations of which excite the new. Of course, none of this can be verified directly, in a positivistic sense, but it is an abstract model that helps to explain the phenomena that arise and to support the idea that predictions of outcomes are very difficult to pin down. Indeed, in education there may be a disadvantage in doing so, because, as I argue elsewhere, education is an emergent phenomenon.

Using visual images to elucidate thinking can be powerful in helping us to understand more complex ideas and assist with verbal information processing (see e.g. Bobek & Trevsky, 2016; McDaniel & Einstein, 1986; Verdi et al, 1997). When I saw the image of the trilobe synoptique, it triggered in me an imaginative response around which I could 'see' how the elements of aesthoecology related one to the other. From that, I was more clearly able to verbalise my proposals.

The dynamic, i.e. the power behind the oscillations, excites this interaction between the aesthetic (or in the case of the model, the affective) and the ecology (the connective element). I suggest that this dynamic is a rhythmic dimension that creates the potential for the affective to correspond to the connective at any one time. Because the affective and the connected may continually change, the rhythmic mediates between the two. In the model of the trilobe synoptique, this rhythmicity is indicated as one of the points of the triumvirate while at the same time producing the synaesthetic patterns in the centre of the trilobe.

The importance of synaesthesia as a potential part of the model only arose because I saw the waves of colours, forming into shapes, in the centre of the synoptique. Synaesthesia is a 'joining of the senses and becomes an important element in the visual imagery element. Sensations in one modality (e.g. hearing) produce sensations in another modality (e.g. colour) as well as its own.' ([www.uksynaesthesia.com](http://www.uksynaesthesia.com)). It may be that synaesthesia is more common than originally thought and may appear on a spectrum among the population in the same way that ASD does. I propose this because there appears to be an important link between synaesthetes and those with ASD (Ward et al, 2017). There also seems to be a link between sensory sensitivity and cognitive ability, and those who display synaesthesia appear to show better performance on

certain perceptual tests (ibid). There has also been a suggestion that synaesthetes should be seen as a new type of gifted student (Cawley, 2010) and also that:

*People with synaesthesia tend to be drawn towards the creative arts and some artists have explored the concept in their works, like the Russian abstract artist Wassily Kandinsky, who had an interest in visualising music in his paintings. In the film 'Sensorium Tests', which explores mirror-touch synaesthesia, the contemporary artist Daria Martin challenges the idea that the act of looking is a passive experience.*

([www.tate.org.uk/art/art-terms/s/synaesthesia](http://www.tate.org.uk/art/art-terms/s/synaesthesia))

It is also of interest that there appears to be a space-time association to synaesthesia (Hale, et al., 2014). For example:

*contiguous time units, such as months, are spatially linked forming idiosyncratically shaped patterns such as ovals, oblongs or circles. For some individuals, each time unit appears in a highly specific colour.*

(Smilek, et al., 2010, p.507)

The use of the visual image, the trilobe synoptique, has been invaluable in communicating the importance of the various elements contributing to an understanding of aesthoecology and in stimulating tangential and deeper thinking of dynamism and synaesthesia. For me, it has been the stimulus from which new ways of looking at aesthoecology have arisen. I believe that process, as well as the outcome, has particular relevance to the resonance of aesthoecology in education.

### **5.3 Aesthetics and affectivity**

Affectivity is an integral part of the aesthetic. It represents a sensitivity to our environment and our subsequent sensorial reactivity and alters the notion of aesthetic to the lesser used *aisthetic*, a term which depends on 'a transformation of the forms of sensible experience, of ways of perceiving and being affected' (Ranciere, 2013, p.ix). It asks questions of our adaptability, our reactivity, our risk taking, our creativity and the relationship we develop with the world around us. Nevertheless, culturally and historically it is difficult to discuss the influence of the aesthetic without continual reference to what many have

categorised as the sole domain of the arts, a mode of intelligibility out of reconfigurations of experience (ibid).

Philosophically speaking, aesthetics relates to the conceptual and theoretical inquiry into both sensual experiences and the arts (Ranciere, 2013; Scruton, 1974). In the late 18th century, this aesthetic-sensory cognition is hinted at by Kant in his *Critique of Judgement* (Kant, 2007/1790), to attempt to integrate what he refers to as 'the Big Three': The True, the Good and the Beautiful, an understanding of which might be legitimately extended into considerations of ethics, politics and creativity. This is very similar to Maslow's concept of being values, which include justice, truth and beauty; he contends that the self-actualised individual is a seeker of these values (Maslow, 1993).

While the aesthetic has traditionally been seen as the domain of the arts it also relates to critical judgements in the study of the mind and emotions, in which case the term aesthetics would be more appropriate. This relates to the sense of beauty. For some writers, e.g. Danto (2003, p.160), to equate beauty and life is of great significance, as he attests when he writes, 'Beauty is an option for art and not a necessary condition. But it is not an option for life. It is a necessary condition for life as we would want to live it.' Consequently, it might be argued that this applies to education (e.g. Biesta, 2013; Maslow, 1993) if we were to accept that education is also not an option for life but a necessary condition. Is it enough for education to be beautiful in its own right, valued for what it is, as opposed to serving some societal purpose?

I have experienced this notion of beauty in school situations that allows us, as teachers, to rise above that which is practical or deterministic. It is illustrated by moments when we realise that something unexpected and radically new has emerged over and beyond that which we are experiencing in the present. I had seen this in moments when, for example, students without ASD interacted meaningfully and closely with children with ASD. The interaction seemed to spark a new perceptual understanding in both. This might be considered as a moment of beauty and insight. These types of event are more likely if you encourage spaces of intra-action that facilitate the chance of that happening, such as the centre for students with ASD, rather than if you think they are going

to happen. I would argue that this represents an aesthoecological episode in the lives of those students, fuelled by affectivity and connectivity.

The arousal of the curious and the awakening of the imagination evoke and reinforce the essential nature of the aesthetic alongside the power, however subtle, that it brings to bear on any intellectual activity. Whether that precedes the intellectual process or is inherent in it may be open to debate, but the fact that these events coalesce in the present is the significant feature.

Quotations from *Selections of Prose Works of William Morris* (Ball, 1931) illustrate the shift in interpretation from the appreciation of beauty itself to progressive social functionality in the late 19th century. This relates in an interesting way the relationship between art and action and aesthetics and politics as expounded further by Ranciere (2013). This may have relevance to any understanding of the aesthetic in education. For example, in writing of William Morris, Ball points out,

*Labour unsweetened by art leads to discontent, unrest and despair, which will at last swallow up all society. All great art of medieval times, he says, is made 'by the people and for the people, as a happiness to the maker and user'; it is the expression of mans' [sic] happiness in his labour.*

(Ball, 1931, p.xxvi)

In contemporary terms, this seems to relate to Ranciere's notion of the factory of the sensible, which he defines as 'the formation of a shared sensible world, a common habitat, by the weaving together of a plurality of human activities' (Ranciere, 2013, p.39). However, he distinguishes this idea of the factory of the sensible from the distribution of the sensible, which he considers to be 'a polemical distribution of modes of being and "occupations" in a space of possibilities.' In this, he distinguishes between an ethos of the shared abode that arises from 'the sedimentation of a certain number of intertwined acts' to raising the question of the relationship between the ordinariness of work and the exceptionality of the artistic (ibid).



Figure 10: Gothic cloisters, Glasgow University [Photograph by Jane Rix]

To reinforce these historical links, and to return to the 19th century, with reference to the building of Gothic churches by the humble working mason, Ball (1931), citing John Ruskin, rather quaintly suggests both moral and practical inferences:

*It is obvious, for one thing, that no great art was ever created by bad men [sic], and Ruskin never swerved from this belief – you must be good or you cannot paint. And it follows that coldness to beauty and the indifference to art characteristic of English puritanism is a bad sign, the sign of a religion cranked and narrow, for nothing but art is moral, and industry without art is brutal, since art depends on and is fed by love. The state of the arts is thus an index of national wealth. Even if an effervescence of art does sometimes accompany corruption in society, it does not alter the fact that art comes from goodness – the evil in society is just a challenge to the good, and brings it out.*

(Ball, 1931, p.xxiii)

In my view, while there is much to critique in these quotations from Morris and Ruskin, they lead us into some valuable ways of looking at the concept of aesthetics in education. Ranciere (2004), for example, refers to aesthetics not as a discipline or as a history but as a specific way for identifying thinking about the arts, which he calls the 'aesthetic regime of the arts' and more broadly 'the distribution of the sensible'. This is the pivotal balance between forms of action, production, perception and thought. He considers the close relationships between politics and art as a form of dissensus because the two activities share a common concern in challenging the status quo. This opportunity to re-order the power relationships leads him to suggest that politics has an inherently



aesthetic dimension and that aesthetics has an inherently political one. This relationship might also be seen in an education context.

Consequently, through a different approach to education, can we, for example, capitalise on Ranciere's ideas of 'the aesthetic regime of the arts' and the 'distribution of the sensible'. Biesta (2006), for example, talks about the idea of *bildung*, which refers to the German tradition of self-cultivation linking philosophy and education, or personal edification. He suggests that this approach 'has always expressed an interest in the humanity of the human being and thus stands for a way of educational thinking and doing that is significantly different from the near-hegemonic educational discourse today' (Biesta, 2006, p.99). This complex concept of *bildung*, that Taylor (2017, p.3) suggests 'refers to developing, shaping, self-formation and inner cultivation', is that which I consider to be a form of holistic evolution indicative of a relationship between aesthetics and ecology. This ontological turn reorientates education from 'the acquisition of skills, the linear transmission of knowledge and the measurement of learning' to 'a notion of education centred on being and becoming' (Taylor, 2017, p.3). But it also evokes a sense of beauty within the education imperative a coherence and harmony which reflects some sense of belonging and enjoyment (Katz-Buonincontro, 2011).

Eagleton (1990) supports this thinking by suggesting that, for Baumgarten, in his *Aesthetica* (1750), aesthetic cognition

*opens up in an innovative gesture the whole terrain of sensation... aesthetic cognition mediates between the generalities of reason and the particulars of sense: the aesthetic is the realm of existence which partakes of the perfection of reason, but in a 'confused' mode. 'Confusion' here means not 'muddle' but 'fusion' in their organic interpenetration, the elements of aesthetic representation resist that discrimination into discrete units which is characteristic of conceptual thought. But this does not mean that such representations are obscure: on the contrary, the more confused they are – the more unity-in-variety they attain – the more clear, perfect and determinate they become.*

(Eagleton, 1990, p.15)

From an education point of view, perhaps this unity-in-variety idea gives some lead into the thinking that the entire curriculum can be aesthetic, thereby removing the assumption that the aesthetic element of a curriculum can be

delivered satisfactorily only through the arts. This same argument applies to the application of creativity. The aesthetic can be defined more broadly in educational terms and starts to infiltrate all aspects of educational experience. This is expanded by Deleuze and Guattari (2013) in their discussion about the rhizomatic nature of knowledge. They write of the principle of asignifying rupture, suggesting that a rhizome 'may be broken, shattered at a given spot, but it will start up again on one of its old lines, or on new lines' (p.8). This rupturing of the rhizome occurs

*whenever segmentary lines explode into a line of flight, but the line of flight is part of the rhizome. These lines always tie back to one another. That is why one can never posit a dualism or a dichotomy, even in the rudimentary form of the good or bad. You may make a rupture, draw a line of flight, yet there is still a danger that you will reencounter organizations that re-stratify everything, formations that restore power to a signifier, attributions that reconstitute a subject – anything you like from Oedipal resurgences to fascist concretions.*

(Deleuze & Guattari, 2013, p.9)

I am eager to examine lines of congruence between the literature and theory of the aesthetic and the educational significance of following this line of enquiry. Guyer (2013, p.30), for example, explains that writers such as Schiller, Ruskin, Morris and Dewey argue that

*aesthetic experience is distinctive in its freedom from our most immediate obsessions with purpose and utility, but the freedom it therefore allows us is not a freedom for the simple contemplation of beauty with no further concerns or implications, but rather a freedom to develop our imaginative and cognitive capacities, to gain knowledge of ourselves and others, and to imagine new ways of life, a freedom that is valued not simply for its own sake but also because of the benefits the development of these capacities can bring to the rest of our lives.*

This illustrates the power of aesthetics not only to influence our thinking about education but also to be inherent in contemporary education philosophy and practice. Guyer (2013) notes that it is probably the tradition of Dewey (2005/1934) that has had the greatest influence on thinking about academic aesthetics, particularly in relation to education. Even in the 18th century, the dominant discourse was to recognize

*the complex rather than simple nature of aesthetic response, the interplay between perception and the higher cognitive capacities of understanding*

*and reason in aesthetic experience, and the variety of both aesthetic experiences and aesthetic objects.*

(Guyer 2013, p.35)

Thus, an understanding of aesthetics suggests complexity not reductionism, and, for an education that is aesthetic, that carries important messages.

The current term, aesthetic, did not arise until the early part of the 18th century and has come to mean a series of accepted expressions such as object, judgement, attitude, experience or value. The relative importance of each of these expressions has fuelled the debates on aesthetics throughout the centuries up to and including the current day. Effectively, they have been distilled into three main foci, namely the practice of art; aesthetic features, e.g. beauty or grace, and attitudes.

Each inevitably overlaps with the other, but during the 20th century the focus has been on the juxtaposition of art and the aesthetic (Scruton, 1974; Danto 1981). It might be argued that contemporary analytic aesthetics is concerned mainly with the philosophy of art, but the analysis of aesthetic phenomena, because of its relevance from an education point of view, must take greater prominence. If aestheticism, as I am proposing, is about beauty, perception, sensibility, criticality, observation, challenge, intuition, sense making and communication, all of which could be argued to be at the heart of the education process, then what is said about these features by philosophers of aesthetics?

Terry Eagleton (1990) reviews the social and political history of aesthetics from the 18th century through to the 20th century in his book, *The Ideology of the Aesthetic*. He explains that Baumgarten was the first to make the distinction between art and aesthetics. But this was not, as he puts it,

*between art and life but between the material and the immaterial: between things and thoughts, sensations and ideas, that which is bound up with our creaturely life as opposed to that which conducts some shadowy existence in the recesses of the mind.*

(Eagleton 1990, p.13)

He interprets aesthetic theories in a political and ideological way, seeing aesthetic experience as a bourgeoisie-led moral improvement programme

whereas, Ferry, a political philosopher, interprets the rise of avant-garde art in the 20th century as being represented only by art that is itself in incessant revolution, thereby recognising that reality itself is both chaotic and different (Ferry, 1993). Aesthetics must, therefore, be associated with a perceived connectivity and not by withdrawal from a shared world. This connectivity, or aesthetic ecology, pervades all that we do and are and, as such, exists extensively in our approach to education, politics and ethics.

## 5.4 Ecology and connectivity

Characteristics that relate aesthetics to the education world need to be explored through an understanding of their overall ecological significance and through notions of inter-connectivity and the identification and importance of space and place. An ecological hierarchy that relates to both space and time, through both aesthetics and ecology, might be seen as a series of different levels, or in concentric circles – perhaps very loosely equating to a meta-state, a meso-state and a micro-state. I am not an advocate of models when thinking of such concepts, but they are helpful, treated with caution, in explaining complex ideas.

The meta-state would reasonably seem to represent an understanding of our global situation and issues facing the planet. This is similar to that which Morton describes as hyperobjects (Morton, 2013) and Lovelock describes as Gaia (Lovelock, 1979). Each of these are all-encompassing phenomena, which connect us to something far greater and yet which impinge on us as humans in every way, much of the time not realised.

The concept of Gaia, first elucidated by James Lovelock in 1979, supersedes this notion of hyperobjects. Lovelock, in collaboration with and elaborated by biologist Lynn Margulis (1988), defined Gaia as

*a complex entity involving the Earth's biosphere, atmosphere, oceans, and soil; the totality constituting a feedback or cybernetic system which seeks an optimal physical and chemical environment for life on this planet. The maintenance of relatively constant conditions by active control may be conveniently described by the term homeostasis.*

(Lovelock, 1979, p.10)

This work, initially shunned by the scientific community, led into a redefined science, which biologists such as Stephan Harding refer to as holistic science (Harding, 2006, p.29). The significant feature of an ecosystem is that it is holistic, interconnected and interdependent. The idea of an ecosystem has developed from an understanding of relatively simple biological relationships to an all-embracing notion, which Lovelock (1979) proposed as the Gaia hypothesis: an integrated, self-regulating system of interdependent parts. Gaia has, however, been rightly criticised by a number of science commentators such as Stephen Jay Gould (1997) for being teleological and therefore construing nature as aimed towards some end point or goal. This is denied by Lovelock. Gould (ibid) suggests that Gaia is a metaphor, not a mechanism, but it seems to me that even mechanisms are in themselves metaphors and treat natural organic systems as machines rather than as self-organising, affective and autopoietic entities.

Bond (2013), writing in *New Scientist*, suggests that views on Gaia changed when public reaction was 'overwhelmingly positive' and confirms that 'The idea that our planet was somehow alive found favour with philosophers, poets, writers, environmentalists, pagans, churchgoers and many others.' He refers to Ruse (2013), a philosopher of biology, who in his book, *The Gaia Hypothesis: Science on a pagan planet*, explains that he traces the Gaia metaphor from Plato, who considered the planet as living and possessing soul and intelligence and then makes connections between Thomas Aquinas's natural theology and the mechanistic approach inspired by the advent of science.

It starts to become clear that, as Berleant notes, 'the concept of the environment as outside, external to the human organism, is a comforting notion now utterly discarded both by ecological studies and post-Cartesian philosophy' (Berleant, 1992, p.5). The notion of the uniqueness of individuals, therefore, is difficult to justify and raises questions of consciousness, identity and individual and collective purposiveness.

Hyperobjects, in themselves a phenomenon of Gaia, are entities of such vast dimensions that they challenge all traditional ideas of the thinginess of things. Perhaps the most obvious example is global warming, although Connolly (2013, p.410) adds contemporary global examples such as cross-regional violence,

rapid migrations of displaced peoples, complex loops between bees, viruses and pesticides and bird 'flu crossings into humans.

In order to understand these entities, events or phenomena, we have to reinvent how we even begin to understand the world in which we now live. That reinvention has to take place at every level and, significantly, with a particular focus on the purpose and process of education, through adopting a genuinely posthuman, ecological approach.

The impact of hyperobjects, within a Gaian and posthuman world, is becoming apparent in diverse ways and yet we seem to be able to push them away in order to protect ourselves from them. The posthuman reality is that our peripheral ecological awareness of impending doom can no longer be held at a distance or be combatted by some delusion that our sub-conscious awareness will not be lived out. The reality of this is described by Timothy Morton:

*I do not access hyperobjects across a distance, through some transparent medium. Hyperobjects are here, right here in my social and experiential space. Like faces pressed against a window, they leer at me menacingly: their very nearness is what menaces. From the center of the galaxy, a supermassive black hole impinges on my awareness, as if it were sitting in the car next to me at the traffic lights. Every day, global warming burns the skin on the back of my neck, making me itch with physical discomfort and inner anxiety. Evolution unfolds in my genome as my cells divide and mutate, as my body clones itself, as one of my sperm cells mixes it up with an egg. As I reach for the iPhone charger plugged into the dashboard, I reach into evolution, into the extended phenotype that doesn't stop at the edge of my skin but continues into all the spaces my humanness has colonized.*

(Morton, 2013, p.27)

It is possible, in the scenarios described above, to evade the imminence and pervasiveness of these feelings. It can be you and the object, separated one from the other by convenient illusions of reality, or an aesthetic understanding that we are all at one, inevitably influenced and affected by a mesh of continuity. We cannot escape. As Morton puts it, 'The more I struggle to understand hyperobjects, the more I discover that I am stuck to them. They are all over me. They are me' (Morton, 2013, p.28).

From an educational perspective, hyperobjects present to us a world that, by its very nature, is unfamiliar. The objects from which hyperobjects are composed

are in themselves 'strange strangers' (Morton, 2011, p.216-217), in that they are strange to each other. This makes them irreducible in an attempt to understand nature or place. This is radically different from any sense of environmental relationality, which 'characterize[s] ecological spaces as (tacitly) homogenous knowable planes or ecosystems' (Saari & Mullen, 2018, p.6).

The inherent nature of a hyperobject lies in its complexity and its juxtaposition. 'Juxtaposition means bringing into uncanny proximity, play or comparison objects and events that are conventionally seen as distant, incompatible or altogether abject in environmental discourse' (ibid, p.7).

To illustrate this in an educational context, I refer to the college art gallery on the college campus and the intra-connections and stimuli arising from it. Juxtaposition might start with the perceptual experience of seeing an abstract picture of a sunrise, for example, which leads into a discussion on climate science, the advent of the human species, the industrial revolution, the power of the Anthropocene and then our own individual implication in it (see e.g. Saari & Mullen, 2018). In terms of the college lunch club, a conversation between a student and a guest might start with the crispness of the broccoli and move to organic farming, to the growth of towns, to the busyness of life, to the problems of ageing, to the National Health Service and to the ethics of universal welfare. Hyperobjects have no boundaries or recognisable constitution and, in that way, knowledge and understanding are able to emerge from spaces that are available.

This type of sequencing between different actants cannot be planned but arises from an initial stimulus. This suggests an epistemology in which 'the idea that knowledge does not bring us closer to what is already present but, rather, moves us into a new reality which is incalculable from what came before' (Osberg & Biesta, 2007, p.46). Knowledge formation of this type stems from an involvement with objects in which the nature of the broccoli is as significant as the person who is cooking it or eating it, or as the gas that is used in heating it or as the table on which it is being prepared. All of these elements exhibit agency as actants (see e.g. Taylor, 2017).

In this way, an awareness of hyperobjects, as illustrated in the examples of the gallery and the lunch club, recognises the nature of hyperobjects as being

objects in their own right and not just the creation of systems or assemblages of other objects (Morton, 2013). They take on their own form. The idea of school and community as separate entities begins to fade and to be overtaken by new and continuously emerging relationships, illustrated by the ideas of 'schools without walls' (Partridge & Bath, 2019) and 'place based education' (McInerney, et al, 2011; Saari & Mullen, 2018).

In searching for a definition of this new approach to science, Harding draws on Jungian psychology. Jung referred to four ways of knowing – intuition, sensing, thinking and feeling – and he arranged these as opposite pairs, intuition opposite sensing and thinking opposite feeling. This recognition of a four-fold system has correspondences with other cultures, and Harding draws on the four elements subscribed to by doctors of the Middle Ages: air, fire, earth and water, while in Greek medicine the reference was to phlegmatic, sanguine, choleric and melancholic. This system is echoed in native North American and Himalayan Buddhist cultures (Harding, 2006, p.31).

Harding makes the point that in contemporary Western culture science is 'based principally on the deliberate cultivation of the thinking function, which is overtly dominant ... Feeling – the evaluative, ethical function – is left out of science' (ibid, p.31). To extend this, Harding draws on the deep ecology movement, which is now firmly anchored within posthumanist understandings.

This term deep ecology was first adopted by Arne Naess (1973) and referred to his quest for the right way to live. Harding explains that the aim of deep ecology is

*to help individuals to explore the ethical implications of their sense of profound connection to nature, and to ground these ethical insights in practical action in the service of genuine ecological sustainability. The emphasis on action is what distinguishes deep ecology from other ecophilosophies, and is what makes deep ecology a movement as much as a philosophy. Perhaps the most fundamental insight of the movement is that all life has intrinsic value, irrespective of its value to humans.*

(Harding, 2006, p.50)

It has been proposed that deep ecology, or ecocentrism, replaces anthropocentrism as a dominant status of the world today. This approach maintains equal status for all species and promotes 'a model of diverse natural



systems arising from interactions and interdependencies' (Miles, 2014, p.39). This transition of understanding goes beyond current ecological movements and requires radical decentring of attitudes and a greater social and political engagement to make any significant and sustainable difference. This must extend into any understanding that we have of educational futures. Thus, Guattari (2014) is prompted to say, in almost a call to arms,

*Current ecological movements certainly have merit, but in truth I think that the overall ecosophical question is too important to be left to some of its usual archaizers and folklorists, who sometimes refuse any large-scale political involvement. Ecology must stop being associated with the image of a small nature loving minority or with qualified specialists. Ecology in my sense questions the whole of subjectivity and capitalistic power formations, whose sweeping progress cannot be guaranteed to continue as it has for the past decade.*

(Guattari, 2014, p.35)

The same context might equally be applied to education. It would be helpful to stop seeing ecology as a noun but to see it as verb, as dynamic inter-relationship, a series of liminalities – the opening up of spaces within which connections can occur. In this way, ecology is action, it is productive, and its product is emergent not static (Osberg, 2008; Osberg & Biesta, 2008). That is an education perspective as well. Karen Barad would consider this as an onto-epistemological framework, which does not work at a distance but is involved (Braidotti & Bignall, 2019, p.45). In that way, 'knowing is a material practice of engagement as part of the world in its differential becoming' (Barad, 2007, p.89).

The middle layer, or the meso-state, represents the multitudinous connections and nodes that play a definable part in the education process for lifelong education – all those spaces, places and contexts within which education is enacted. It connects the outside with the inside, the planet with the individual, and it represents the boundaries between spaces. It is an essential part of the education-ecology mesh that provides the stimulus with which, and within which, to interact with the materiality of learning. It is here that spaces and thresholds exist. They are everywhere and nowhere and represent liminal zones within which transformation is possible. This education mesh would include institutional places and spaces such as museums, galleries, theatres

and concert halls; open spaces such as nature reserves and woodlands; architectural spaces including buildings and sculptures; social spaces such as parks and city centres; and communication and transport spaces, such as roads and railways. These need to be seen not as separate spaces but in terms of their interconnectivity and their holistic nature drawing on the animate and inanimate as education resource.

The meso-state is not reliant on being in one place or another but is more to do with the relationship of all actants within the spaces. It is inherently multi-disciplinary and experiential and, in the context of schools, connects self with community. It stretches beyond school in order to understand the context of school better. It may not be seeking out new stimuli in any particular place but seeing more strongly and being more aware of the intra-connections present in the places that are inhabited. In that way, it is not to see the barriers forming discrete places but, in being sensitive to the connectivity within and beyond spaces and places, it 'offers opportunities for new understandings of creativity which acknowledges spaces, environments and objects as contributors to the creative process, rather than simply seeing them as context' (Chappell, 2018, p.10). Children and young people live in a complex and diverse world in which boundaries become blurred and, rather than being considered as 'entities existing in the surrounding world', might more clearly be seen as 'living as an entangled part of the intra-relational world' (Ceder, 2015, p.35). Thus:

*The knowing subject is not Man, or Anthropos alone, but a more complex assemblage that undoes the boundaries between inside and outside of self, by emphasizing processes and flows. Neither unitary, nor autonomous, subjects are embodied and embedded, relational and affective collaborative entities, activated by relational ethics.*

(Braidotti, 2019, pp.45-46)

Tim Ingold (1996, 2018) and James Gibson (1966, 1979) share interests in the notion of affordance – a term similar to the ecological niche, which concerns the relational links between an animal, including the human animal, and its environment. It is a relational term and depends on the organism's intent and capability. This is captured as a being-in-the-world ontology, which is informed by the Husserlian notion of *umwelt*. This represents the biological aspects of communication and signification in all organisms and has special importance for

the mapping of the self within the world of objects. It indicates a multi-dimensional ecology within which different objects have different significance according to the organism's perception at any particular time. This may also be the case at different stages of the life cycle and is likely to be dependent on, especially if not exclusively in humans, a particular world view. This notion of *umwelt* may be considered to have relevance in particular educational places and cultures.

Ingold (1996), in Descola (2013, pp.65-66),

*characterizes the relations of hunter gatherers with their environment as a total immersion, an active, perceptive and practical engagement with the components of the lived world, by contrast with the classic anthropological perspective which begins by positing the exteriority of nature, which must then be grasped through thought and appropriated by symbols according to a determined cultural scheme before any practical activity might be carried out within it.*

The lowest level, the micro-state, is related to the individual – the level at which learning becomes education through the emergence and construction of an educational landscape that operates through the meso regions and out to the meta regions and back. The individual can only exist in relation to these areas and by transcending the boundaries. It is by accepting these series of transitions that the ideas of superficial constructed boundaries are negated.

This paradoxical situation accepts that at any one time our horizons can be vast or miniscule and our view of the horizon correspondingly becomes profound:

*If everything is interconnected to everything, what exactly are the things that are connected? In some significant sense, if we already know what they are, if we already have a box in which to put them, they are not truly different beings. If the ecological thought is profound as well as vast, we can't predict or anticipate just who or what – and can we tell between 'who' and 'what', and how can we tell? – arrives at the intersections in the unimaginably gigantic mesh.*

(Morton, 2012, p.38)

In accepting this complexity, and applying it to education, we are accepting that, while in a conventional sense we imagine that learning is the business of the individual, it is simultaneously all too apparent that it is working at a multitude of levels, inside and outside, across boundaries, within boundaries and between

boundaries. It is, in this way, shared and distributed, allowing knowing and knowledge to be disseminated and dispersed within collective contexts. In this way, authority is also shared, thus rejecting dichotomies such as human versus animal, arts versus sciences, child versus society, teacher versus learner and knowledge versus knower (Davis & Sumara, 2006).

Thus, instead of seeing authority as

*an external and monological imposition, authority might be described in terms of capacities to invoke prevailing discourses – or, in complexity terms, to act within a consensual domain. Once again, the explicit purpose of these theorists' rhetorical gestures is to render problematic the assumption that the locus of learning is the individual. Within complexity thinking, just as learning is distributed among agents and across levels of organisation, so is authority.*

(Davis and Sumara, 2006, p.145)

Consequently, the individual in a complex ecological system can never be seen to be an object at the centre but is implicit in a shared orientation within and towards the possibility of emergence. Individuals are enmeshed within units of complexity, social collectives, from which in education terms interpretation and meaning emerge. This has profound implications for time and space. Time is not linear but might be seen as an interwoven network similar to the rhizome conceived by Deleuze and Guattari (2013). If time – past, present and future – is likened to the rhizome, then 'we can consider ourselves at an equal distance from all times and freely engage in relationships with any. No longer do we feel only close to the present, while past and future are distant' (Kurokawa, 1991, p.45). This relativity of time and space is a symbiotic relationship relating to both diachronicity and synchronicity – the importance of being in the present as well as an awareness of past and future. According to Grosz (2004), the present is linked to space both by perception and action, and she explains this by claiming,

*The distance of an object in space is a direct measure of the threat or promise of that object in time: the nearer the object the more immediate its impact on the perceiver.*

(Grosz, 2004, p.177)

Animals possess powerful awareness of space, and by moving from one place to another they acquire a sense of direction. But it is knowing that this is relative to other things, which share the environment, that determines space and place (Tuan, 1977). Space conceived in this way 'represents our near future, that future which is already tied to the present ... [and] ... is implied in or posited by our current perceptions and actions' (Grosz, 2004, p.177). Time and space are vital constructs in the conception of our ecology.

This suggests that our ecology is multi-dimensional and that the connectivity between those dimensions may well take place through a rhythmicity. It is well documented that physiological rhythms become co-ordinated between individuals. For example, it has been recently found that the individual members of a theatre audience will show synchronicity in their heartbeat rhythm even when measured during an interval (Devlin, 2017). There is evidence of phase synchronization between maternal and foetal heart rhythms (van Leeuwen et al., 2003), and of the synchronization of heart rhythm between co-sleeping partners (Yoon et al., 2019).

## 5.5 Anticipation and rhythmicity

*Does taking comfort qualify as life? Only if it flickers. Is taking comfort death? Yes, if it stays in place.*

(Manning & Massumi, 2014, p.26)

The relationship between aesthetics and ecology, in its symbiotic form, as an aesthoecology, needs to be understood within a temporal perspective. This represents an integration of past, present and future and in education terms it is the interaction of human and non-human systems, with differential capacities for change, that engages us within a volatile ecology and a dynamic aesthetic. This unpredictability feeds an already complex system and, in that way, characterises various orders of emergence (Osberg & Biesta, 2008, 2010).

*Complex systems do not only increase their own complexity; they also change it. They are emergent orders. An emergent order is characterised by being changeable and unpredictable. Learning as a conscious activity and teaching as a communicative social activity both belong to the category of complex, emergent systems.*

Education frequently demands a discourse that refers to the future, but it refers to it in a specifically linear way and with neo-liberal expectations of what the future might hold if the right things are completed in the present. The holding out of hope for a good future tends to be the accepted orientation in education. However, this notion of moving on might be questioned, particularly in the light of aesthoecological understandings, to create a more reflexive and complex understanding of anticipated educational landscapes. Clegg (2010) reviews this notion of time, referring specifically to the work of Barbara Adam (1995) who argues for

*the co-existence and intermingling of different dimensions of time as co-present: time as linear divisible clock time; temporality as our being in time; timing as in 'when' time; and tempo the intensity of time.*

(Clegg, 2010, p.347)

This challenges a number of assumptions, not least the common understanding of linear Western time that is in contradiction to more fitting notions, particularly with respect to aesthoecology, of 'cyclical rhythms of the anthropological past' (ibid). The linkage of ecological concerns to the ideas of the future and the time frame are well described by Adam and Groves (2007) in the prologue to their book, *Future Matters: Action, Knowledge and Ethics*, in which they maintain that futures are not just imagined, they are made 'creating chain reactions that permeate matter and stretch across time and space' (Adam & Groves, 2007, p.xiii). These interconnectivities referred to earlier raise questions about responsibility for the future that is invested in us all. But they also raise questions about the extent to which the future can be determined and to what extent we see it in emergentist terms. Either way, the outcomes of actions can have very long-lived effects.

For example,

*The innovative use of the earth's resources for the production of energy ushered in the industrial revolution, but it has taken until now for people to recognise the long-term consequences of these practices and begin to accept the need to produce collective responses to mitigate the worst environmental and climatic impacts. Not our generation, however, but an open-ended line of successors will have to endure, absorb and deal with*

*the long-term effects of developments we largely associate with scientific and technological progress.*

(Adam & Groves, 2007, p.xiii)

The notion of rhythm may help us conceptualise space more creatively.

Lefebvre (2013) describes and understands the importance of rhythm through his development of rhythm analysis, an analytic tool that

*has been widely used to study place, especially city space included in historical accounts of urban street life ... everyday routines in contemporary urban spaces ... gentrification ... gender and ethnic inequalities in the night time economy ... absence ... consumption ... street performance ... festival spaces ... domestic space ... imagined space ... the sounds ... and senses ... of the city.*

(Lyon, 2019, p.39)

The prevalence of rhythms is often overlooked. It is true that we can cite particular rhythms that impinge on us regularly, many referred to above. Routines that are either imposed on us or that we choose to regulate ourselves are the most obvious. The ones that are more subtle are those that superimpose one upon the other and those that interconnect like the cogs of a machine (Alhadeff-Jones, 2018). The rhythms are multi-dimensional, each relying on the other and working in a synchronous fashion. Rhythmicity, synchronicity and symmetry are in themselves also interconnected, and each can be broken, potentially leading to chaos and breakdown. However, a new symmetry or a new rhythm often arises, representing permanent change, a transformation and a new way of being. These changes can only work in one direction: they are harbingers of the future.

Activities can often become uncoupled by unforeseen encounters. In activities such as the lunch club, where there was significant interaction between different groups and ages of people amid the collaborative nature of spaces and objects, there were opportunities for great revelation and personal growth. This disruption could be seen as a breaking of the normative rhythms of encounter, resulting in epiphanies or opportunities for permanent change (Alhadeff-Jones, 2018; Denzin, 2014).

Temporalities, and the multiple impact and relevance they have, contribute significantly to how we behave and how we relate to others and to our environment. The heterogenous nature of time is complex. It is also a very important phenomenon in education and relates very closely to all that I have proposed in an understanding of aesthoecology.

## **5.6 Summary**

The purpose of this chapter has been to provide an historical, sociological and philosophical background to each of the essential elements of the notion of an aesthoecology. While each are concepts in their own right, there would appear to be something synchronous in the way in which they form an assemblage. If, as I contend, nothing stands on its own, and everything has connectivity with everything else, it is in seeking the synchronicities that new conceptions arise.

I have conceived of aesthetics as equating, in large part, to an affective sense of being. That intense sensitivity provides a capacity for connection that can be enhanced or dulled by experiences to which we are exposed. That connectivity is expressed through reference to ecology and the recognition that we are part of something far greater. How we perceive that greatness appears to depend on our capacity to visualise the intersections of our landscape and to interpret our homelands. At times, that might be captured by the vastness of Gaia and at other times by the intimacy of the colour and texture of an old brick wall.

The processes at work in making those connections may be transitory, they may be intermittent or they may be more permanent. There is an inherent rhythmicity to that connectivity. In making those connections, there develops a relationship in the nature of which the properties of the assemblage are apparent. In the next chapter, I unravel and discuss the processes and contexts within which these relationships may emerge.



# Chapter 6 – Aesthetics and Ecology: A Symbiotic Relationship

## 6.1 Introduction

Following the previous chapter, in which notions of the posthuman and the new materialist were exemplified, this chapter further expounds the importance of the connectivity between aesthetics and ecology. This context provides an onto-epistemological framework, which, through a new materialist paradigm, signals the importance of this intimate relationship as a precursor to developing new understandings of the education imperative.

I develop further the argument that the relationship between aesthetics and ecology is more than a mere association (Drenthen & Keulartz, 2014). It is symbiotic in that the two become interdependent. They form an association that is very different, and more complex, than just the summation of two items. This might be considered to constitute an assemblage, in which the component parts relate in ways that allow emergence at a variety of different levels (DeLanda, 2006). The aesthetic is, or at least is closely related to, an affective way of being, which orientates our responses to the environment (Tilley, 1997), our ecological landscape (ecoscape) thus forming a flexible, cognitive cartography that has inherent connectivity and many entry and exit points.

This way of thinking about things relies on an acceptance of a complex, interconnective and multidimensional relationality (Morton, 2010). Journeying, therefore, becomes an affective response (e.g. Gregg & Seigworth, 2010) to ecological circumstance at each point, which accepts complexity and shuns reductionism. The aesthetic may only be able to do this in an ecological context.

These aesthoecological responses may be just benign, and of low affectivity, but on significant numbers of occasions they are intense, resulting in, for example, aesthetic chills (McCrae, 2007; Schoeller & Perlovsky, 2016) or physiological responses corresponding to highly emotive and meaningful events. These are transformative and mark a threshold of change, which is irreversible and in contrast to any notion of stasis. Recognition of these

moments of dynamic and active transformation, or aesthetic accordance, represents a key aspect of our aesthoecological position.

A situation of intense and meaningful relationship with the place, space or event is a recognition of our aesthoecology, however brief or prolonged that affective encounter may be. Spaces in between are liminal – periods of affective anticipation – culminating in threshold moments. Much of the time, I argue, we exist not in stasis but in a state of liminality, continuously poised for change and mediated by an ecological rhythmicity. To exist in stasis is to exist in an-aesthesia, cutting off all (or most) creative potential. I argue that the aesthetic, in an ecological context, is an affective condition of dynamic, unpredictable and emergent change (Massumi, 2015). These are the situations we should be seeking in optimal educational situations.

Thus, in a series of temporal dimensions, we sketch out our landscape through a relationship with (i.e. the ecological dimension) and an affective awareness of (i.e. the aesthetic dimension) both space and place. This, within a critical understanding of anthropocentrism and posthumanism potentially has, I contend, significant influence on education thinking into the future and stimulates debate on the fundamental meaning of education itself. This may be carried out within a variety of philosophical contexts, but I formulate the argument that an important ontological approach is to view these issues through the symbiotic relationship between aesthetics and ecology.

## **6.2 Aesthetics and ecology: a further turn to posthumanism and new materialism**

While there is a range of definitions and interpretations of posthumanism (Braidotti, 2013; Braidotti & Bignall, 2019; Haraway, 2008, 2016; MacCormack & Gardner, 2018), I am persuaded by notions espoused by writers such as Braidotti, who sees the 'critical post human subject within an eco-philosophy of multiple belongings, as a relational subject constituted in and by multiplicity' and by the subject that 'works across differences ... but still grounded and accountable' (Braidotti, 2013, pp.48-49). She sees this as embedded in complexity and '... resting on the ethics of becoming, founded upon an enlarged sense of interconnection between self and others, including the non- human or

“earth” others by removing the obstacle of self-centred individualism’ (ibid, pp.49-50).

To parallel this in biological terms, writers such as Donna Haraway, in talking of her own self, relish the fact that

*... human genomes can be found in only about 10 percent of all the cells that occupy the mundane space I call my body; the other 90 percent of the cells are filled with the genomes of bacteria, fungi, protists, and such, some of which play in a symphony necessary to my being alive at all, and some of which are hitching a ride and doing the rest of me, of us, no harm. I am vastly outnumbered by my tiny companions; ... To be one is always to become with many.*

(Haraway, 2008, pp.3-4)

This challenge to the anthropocentric condition reconfigures the relationship between humans and animals and indeed between humans and the non-animate world. Anthropocentrism, as opposed to an ecocentric perspective, proposes that human beings are the most important species on the planet and, therefore, possess a status that is of a higher moral value than that of other animals. Alternatively, an ecocentric perspective sees humans as a symbiotic part of, intimately entwined with, as opposed to separate from, what we dubiously term as ‘nature’. This ethically loaded perspective subscribes to one of power with as opposed to power over, thus possessing intrinsic values and perspectives beyond the human.

Anthropocentrism is generally considered to have contributed to a new geological era, the Anthropocene, which constitutes the age of human impact on the planet often considered in relation to negative conditions (e.g. Chernilo, 2016; McKibben, 2010). It frequently refers, for example, to potential environmental crises, events which Morton calls hyperobjects (Morton, 2013), such as climate change, global warming and the impact of plastics on the world. While these are undoubtedly of significant ecological and social consequence, the answers to other challenges and changed relationships lie in positively accepting this reorientation and accepting the opportunities that arise from it, not least in the field of education.

This turn to a new materialist perspective accepts a new orientation of the world around us, thereby forming new understandings of relationship. Manuel

DeLanda, for example, in Dolphijn and van der Tuin (2012, p.39), claims that 'Any materialist philosophy must take as its point of departure the existence of a material world that is independent of our minds', and he goes on to ask, 'If the mind is not what gives identity to mountains and rivers, plants and animals, then what does?' (ibid)

One proposition, illustrated by new materialism, asks

*How the mind is always already material (the mind is an idea of the body), how matter is necessarily something of the mind (the mind has the body as its object), and how nature and culture are always already 'naturecultures' (Donna Haraway's term).*

(ibid, p.48)

Therefore, one key to this challenge of anthropocentrism, and any subsequent development of the notion of an aesthoecology, must lie in our understanding of the relationship between nature and culture. As Braidotti puts it,

*We cannot assume a theory of subjectivity that takes for granted naturalistic foundationalism, nor can we rely on a social constructivist and hence dualistic theory of the subject which disavows the ecological dimension.*

(Braidotti, 2013, p.82)

Inherent in any assumption that nature and culture may be seen traditionally to be at separate ends of a continuum, is the idea that the human species can set itself aside from the environment that envelops it. In this context, nature tends to be seen as possessing instrumental values, whether that be in providing beauty, food or sport, for example. Consequently, the conservation or preservation of nature, is inevitably and primarily (if not exclusively) based on its value to the needs of humans.

Latour (2005) is of the view that nature and culture are much flatter than this and argues for these two entities to be seen as hybrids. This is at the core of his actor-network theory (ANT) in which human and non-human actors form linkages in order to be more persuasive, although more recently speculative realists might challenge this assumption because 'to say "everything is a hybrid" would be to say that nature and culture are always mixed: an idea that must be

rejected, since this preserves the very two terms that Latour meant to abandon' (Harman, 2018, p.58).

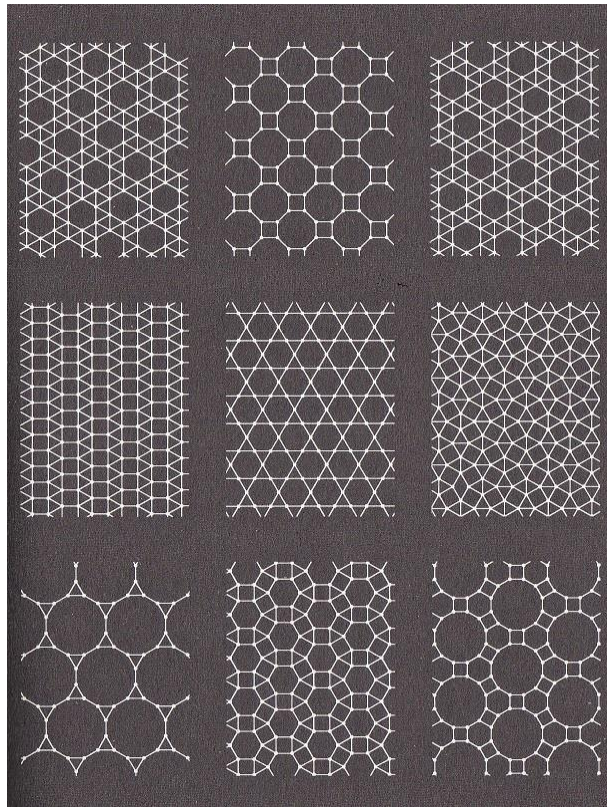
New materialisms, which raises materiality 'to something more than "mere" matter: an excess, force, vitality, relationality, or difference that renders matter active, self-creating, productive, unpredictable' (Coole & Frost, 2010) are an understanding of our perception and challenge to these inherent assumptions. This aesthetic potentiality facilitates the perception of that which is greater than the immediate, to anticipate and influence change and constantly to be on the edge of awareness. This liminality is an aliveness that facilitates the dynamism between stasis and the periodicity of creative activity.

Activities in the college, particularly illustrated by the lunch club or the gallery, displayed this notion of liminality. I believe that it is shown by an expectation of the participants that change is likely to happen, that it is something to be looked forward to and that there is benefit to it. Students or members of the community, through their involvement with the lunch club, were excited by an anticipation of what might become and the emergence of the new.

I consider that this is at the epicentre of the relationship between aesthetics and ecology, one which is symbiotic and is characterised by an affectivity, a connectivity and a rhythmicity.

### **6.3 Aesthetics and ecology: symmetry and transformation**

Aesthoecology is about the perception, the interpretation and the personal defining and re-defining of the world around us, an educational activity in itself. The world, as we interpret it, is organised around symmetrical patterns. This is apparent in almost every aspect of our consciousness. Alternatively, it may just be a convenient way of making sense of the world – a means of classification and clarification. The nature of exact symmetry is stasis, which appears to be unable to bring about change or transformation.



*Figure 11: Simple tilings or tessellation - repeating patterns over an infinite surface [Permission from Wooden Books Ltd, Glastonbury, Somerset]*

Symmetry is widely understood as an informal description of the regularities of structures and shapes and, in a whole range of ways, its contribution to a sense of stasis in all the landscapes we recognise. These static regularities feel very familiar and comfortable. Hence, landscapes tend to feel very homely, or at least recognisable, and consequently, in art for example, they are often depicted as such. Symmetry, because of its association with harmony, beauty and unity, has been seen as integral to our theories of nature, but it is important to note that variations from this symmetry may be of even greater significance.

Symmetry seems to act as a connection between the work of the artist and that of the scientist and therefore accords with the central theme of this chapter, which argues the links between aesthetics and ecology. Symmetries in nature, according to Greene (2000, p.169), are 'deeply satisfying; they highlight an order and coherence in the workings of nature.'



*Figure 12: Cross-section of Nautilus shell, illustrating symmetry and Fibonacci golden ratio  
[Photograph by Lorna Roberts]*

He likens them to art and music in suggesting the ‘elegance of rich, complex, and diverse phenomena emerging from a simple set of universal but often static laws’. This may be at least part of what physicists mean when they invoke the term beautiful. Stewart and Golubitsky (1992, p.27) refer to the work of Hermann Weyl (1969) who combines the importance of symmetry in art and philosophy as well as in mathematics and science:

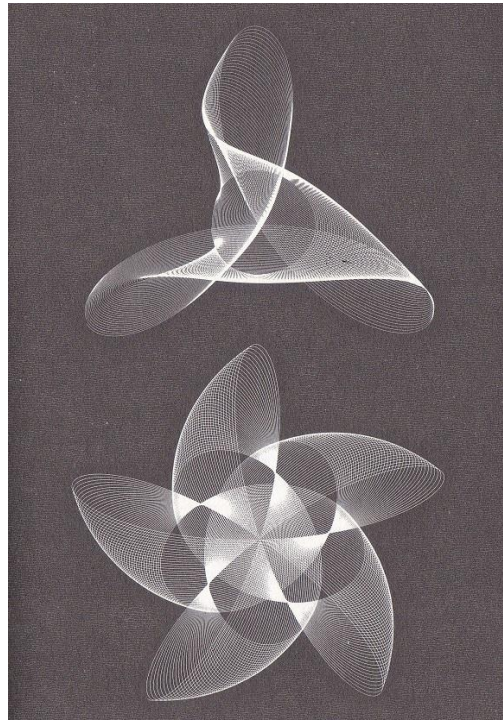
*If I am not mistaken, the word symmetry is used in our everyday language with two meanings. In the one sense symmetric means something like well-proportioned, well-balanced, and symmetry denotes that sort of concordance of several parts by which they integrate into a whole. Beauty is bound up with symmetry.*

I would argue that the breaking of symmetrical patterns appears to be of equal, if not of greater, importance and is significant in the process of organic and creative change. It seems to contribute to the phenomenon of emergence, which is an unpredictable event. For example, it was always assumed that systems, after periods of flux and variation, would naturally return to initial values.

The assumption of optimal stasis in systems was challenged when Prigogine and Stengers (1984) studied those which deviated far from equilibrium. At this point, quite surprisingly, there appeared to be a transformation from disorder



towards order, and new dynamic states of matter seemed to arise. This reflected an interaction of the system with its surroundings, giving rise to dissipative structures, which provided a range of radical choices and were identified by spontaneous symmetry breaking. This results in the formation of chaotic, complex structures from which, most crucially, emerge new forms of symmetry.



*Figure 13: Geometric figures, illustrating the shapes of sounds [Permission from Wooden Books Ltd, Glastonbury, Somerset]*

In essence, this provides the conditions for dissipative structures to allow for bifurcation, or a form of branching, which appears to provide opportunities for change, and this also, somewhat loosely, accords with the rhizomic analogies proposed by Deleuze and Guattari (2013, pp.1-27).

In symmetry breaking, there may be many radically new symmetries that can be derived from the original symmetry. Picking one of the many is what breaks the original symmetry but is also what generates a new symmetry to, in its own turn, be broken. This is just one example of a natural and spontaneous act of creativity. This consideration of symmetry breaking may be key, or at least pivotal, in understanding the dynamic relationships involved in aesthetics,



particularly in relation to its ecological context. While Berleant (2010, p.26) sees the aesthetic as offering 'methodological, normative, judgemental and experiential dimensions that are central to our purposes', the originator of the term, Alexander Baumgarten (1714–1762) refers to the Greek *aesthesis* (also see Ranciere, 2013), as the whole region of perception and sensation. He considered that aesthetics, the science of sense experience, was the most perfect kind of knowledge that could be had because it is fundamentally about the construction and emergence of new order, that which may now be apparent and distinct in the science of symmetry. Crucially, there can never be symmetry without symmetry breaking.

Considerations of symmetry and symmetry breaking present challenging questions concerned with being and becoming, between permanence and change. These transitional moments, or threshold events, which embrace the ideas of liminality and our vision of nature, appear to be subject to radical re-interpretation to incorporate the multiple, the temporal and the complex, such that irreversibility is at the centre of a different type of unity initiating order from chaos (Prigogine & Stengers, 1984).

The discussion of symmetry in this chapter represents a theoretical proposal that supports the symbiotic relationship between aesthetics and ecology, although symmetry itself does not necessarily transfer directly into pedagogical consideration. This notion of symmetry is highly speculative but seems to link in some way to emergence, and I am arguing that both aesthetics and ecology (affectivity and anticipation), particularly in symbiotic relationship, are concepts of emergence.

Is it possible that a form of knowing through the aesthetic can be illustrated through the notion of symmetry? In this way, form and function might be related and, therefore, in educational terms, the future may be seen to be kept open by the perception and utilisation of spaces that appear. This may lead to organisational beauty, a coherence and harmony, arising from fragmentation of existing structures. Could this beauty be bound up with symmetry and, if so, might it be perceived as an event or a transformation? In this way, symmetry may be equated with identity and a developing educational landscape, which might be described by the transition from 'being to becoming'. For example, in

the gallery space, there was an expectation that the artefacts on display and the spaces made available would be perceived very differently by different groups of students.

This difference in perception might be seen to underpin different perspectives of affective education in that it might point to strong connectivity between the science of matter and structures and an appreciation of beauty working at different levels (Latimer & Miele, 2013; Leder, et al, 2018). In trying to capture an understanding of affect, my theoretical exploration of notions of symmetry and symmetry breaking could contribute to new and experimental epistemologies that link with aesthetics and ecology. Understanding perceptions of symmetry may also help in bridging the gap between science and arts in a conventional curriculum. For example, Leder, et al (2018, p.2) claim that 'disciplines as diverse as biology, chemistry, physics and psychological aesthetics regard symmetry as one of the most important principles in nature and as one of the most powerful determinants of beauty.' This paper goes on to claim that contrary to the 'high esteem that symmetry has in the sciences, symmetry has a rather low standing in the arts and humanities' (ibid).

In an interdisciplinary study, researchers found that non-art experts considered that symmetrically complex stimuli appeared most beautiful, but experts in art saw asymmetry and simple stimuli to be the most beautiful (Leder, et al., 2018). Symmetry and beauty are often linked, particularly by scientists and mathematicians (see e.g. McManus, 2005). Philosophers and art historians, however, generally agreed that symmetry was thought to have a somewhat sterile rigidity that made it less attractive than the more dynamic, less predictable beauty associated with asymmetry (ibid).

Consequently, from an aesthoecological perspective there is evidence to suggest (e.g. Leder et al., 2018; McManus, 2005) that a greater understanding and appreciation of symmetry, asymmetry and symmetry breaking may lead to greater appreciation of its application to epistemology and it is, therefore, worthy of further study.

## 6.4 Liminality and transformation: affect and aesthetic events

Thus, the importance of aesthetics is that it can provide a portal into some fundamental aspects of human nature that emphasise the affective and rhythmic nature of emotional responsiveness. An area of significant interest is the transition from one state to another due to these affective events in relation to ecological positioning and, at once, apparent in liminality as a prelude to transition.

These important transitional moments rely on the body's capacity, at any one time, to affect or to be affected. The crossing of a threshold, which moves change on to a different ontological level (Massumi, 2015, p.48), is a process of transformation and is largely irreversible (Meyer & Land, 2006).

Liminality is an important concept that can be considered as an in-between space determined by being both 'a point in time and state of being' (Barradell & Kennedy-Jones, 2015, pp.541-2). It is frequently a term used in ecology as a zone of transition as, for example, on a shoreline or in the transition from land to water at the edge of a pond or lake. In anthropology, it is a term used to describe rites of passage, and Turner (1969, p.95) refers to 'liminal *personae*' (threshold people) as persons who 'elude or slip through the network of classifications that normally locate states and positions in cultural space.'

These liminal entities are described as being betwixt and between (Conroy, 2004). Turner (1969, p.95) refers to this state as being likened to 'death, or being in the womb, to invisibility, to darkness, to bisexuality, to the wilderness, and to an eclipse of the sun and moon'. These wide-ranging metaphors, within the context of liminality, potentially have a very significant relevance to considerations of education (Conroy, 2004).

In this respect, Conroy (2004, p.53) sees liminality in binary terms, and similar to borders, in which the threshold (Barradell & Kennedy-Jones, 2015) may be seen as both the entry and exit point between zones of experience or understanding. These contact zones, in anthropological terms, may represent spaces in which there is a meeting of cultures and minds, but they do not necessarily always exist at the edges. They may instead be considered as

interstitial spaces, where differences may be temporarily abandoned, and it is this emergence of the new within that distinguishes the liminal from the border – a series of whirlpool-like lacunae which lie ‘betwixt and between’ (Conroy, 2004; Turner, 1969). In this way, there is not a linear trajectory but more of a multi-dimensionality to transition. This expression of liminality may be relevant to interesting discussions or conversations, cultural interactions or can be equally extended to include symbiotic relationships with all organisms and physical environments.

This position of liminality entails being on the edge of awareness and in sensitive anticipation of the next event. This represents a constant state of emergence and, thus, this affective positioning would ‘feel a great deal less like a free fall if our most familiar modes of inquiry had begun with movement rather than stasis, with process always underway rather than position taken’ (Gregg & Seigworth, 2010, p.4). Accordingly, a new materialist approach situates the aesthetic, the affective dimension, as a between relationship, thus changing the dynamic vis-à-vis the human and non-human, the material and the immaterial, and the social and the physical.



*Figure 14: Water splash, illustrating symmetry breaking [Photograph by CK Foto]*

Affecting and being affected may be considered to be two aspects of the same event, which isolate on the one hand the object and on the other the subject.

The interaction between the two governs the active transition from one state to another. This transition is felt; it is a quality of experience, which leaves a memory such that 'the body has a past that follows it' and this sets up 'a re-activation of the past in passage towards a changed future' (Massumi, 2015, p.49). The study of aesthetics can consequently illuminate fundamental and primordial aspects of human nature such as rhythmicity. This may be displayed, for example, through music, art, dance and poetry and is captured by a form of aesthoecological cognition within a co-ordinated, and yet emergent, synchronicity.

The notion of being absorbed within our immediate environment is a powerful one. It is similar to an act of dance because of its interactive, spontaneous and intrinsic nature. It is behavioural ecology in motion – 'the creation of an occasion of experience' (Berleant, 1991, p.154). It possesses connective tension and provides and invokes a continuity of performance that is vital according to Berleant in creating an 'aura that encloses choreographer, dancers, audience, set, and music, each contributing to a common event ... a synthesis here not a summation' (Berleant, 1991, p.155).

This is similar to Christopher Small's conception of musicking, where composer, performer and audience are all equal participants in the musical experience. Consequently, Small defines music as a verb – 'to music is to take part, in any capacity, in a musical performance' (Small, 1997, p.2), and, 'The act of musicking establishes among those present a set of relationships, and it is in those relationships that the meaning of the act of musicking lies' (ibid). Interestingly, Small also describes music as 'a mode of exploration by which we explore ourselves, our experience and our environment' (Small, 1975, p.163). This is unquestionably an educational, aesthoecological event.

In some ways, this collective rhythmicity lies at the basis of aesthoecology, but it is much more complex and all-embracing than this. It is also concerned with the way in which our environment, or our ecology, impacts on us, and music, for example, becomes a reflection of our natural and genetic ancestry. Our ecology exists in the reflection of our aesthetic appreciation and in this way our aesthetic nature is at the very heart of an education imperative.

It is already apparent that foetal heartbeat will synchronise with that of the mother. Interacting fields of force, a connecting rhythmicity and synchronicity, are also apparent in a range of aesthetic experiences. This includes, as I have illustrated, musical performances, thus providing additional evidence of the artistic already deeply embedded in our natural environments. In a neurophysiological sense, these appear to be a universal emotional experience that is elicited in response to musical stimuli (McCrae, 2007) as well as in the visual arts, literature and religious practices (Schoeller, 2015). There is, as I have said, evidence to suggest that the pulses of individuals in an audience synchronise, which suggests that going to a performance can connect individuals, even strangers, on a deeper level, enhancing social bonds more powerfully than previously thought (Devlin, 2017).

These responses are only one part of an elaborate matrix of affect, which represents an active phenomenon. The goosebump, for example, is what is noticed as an external illustration of a greater bodily experience. It indicates the arrival of an emotional awareness, or sympathetic awakening, which places the body in a place of greater receptivity. It heightens the senses in a way that a straightforward reactivity cannot, and this affectivity is in a mode of anticipation – affective anticipation. This places the subject synchronously in tune with the environment, which is an essential characteristic of rhythmicity.

## **6.5 Aesthetics and ecological rhythmicity**

It is important, from a posthumanist point of view, as well as from the education perspective of this thesis, to extend our understanding of nature, environment and cartography. Thus, the very notion of an aesthoecology places us within a web, a matrix or a plasma and, therefore, in a new materialist way, humans are continuous with as opposed to placed within, in tune with as opposed to reacting to, our wider environment. Being acutely, almost viscerally, aware of these sensory experiences placed on us by our positioning automatically bestows the aesthetic dimension. Morton (2007, p.26) claims that ‘consideration of the aesthetic is vital, since the aesthetic intertwines with the idea of a surrounding environment or world.’ To embed this aestheticism within our

ecology, as I propose, has profound implications for our understanding of continuous temporal change.

I was recently at a conference dinner and was seated next to the poet, Alice Oswald. I asked her whether she thought 'poetically' just as some musicians claim to have music in their head all the time. She thought for a moment and then replied that she did not think poetically, as such, but 'rhythmically'. In that way, it is possible to see rhythm as a central feature that not only links artforms, and consequently has a distinctly aesthetic nature, but inherently links aesthetics to our environment.

*whenever currents of water meet the confluence is always the place  
where rhythmical and spiralling movements may arise,  
spiralling surfaces which glide past one another in  
manifold winding and curving forms  
new water keeps flowing through each single strand of water  
whole surfaces interweaving spatially and flowing past each other  
in surface tension, through which water strives to attain a spherical drop  
form.*

(Oswald, 2002, p.20)

This form of speculation did not escape John Dewey (2005/1934), who considered that

*Interaction of environment with the organism is the source, direct or indirect, of all experience and from the environment come those checks, resistances, furtherances, equilibria, which, when they meet with the energies of the organism in appropriate ways, constitute form.*

(p.153)

It might be argued that rhythm always precedes art, and it is certainly inherent in communication between all species, having temporal and somatic components. It is part of the very lifeforce (Massumi, 2015; Berleant, 2000). This is most easily understood through music and dance, both of which are displayed in, for example, tribal African music as a form of communication. This short YouTube film illustrates the very strong links between visceral and somatic rhythmicity and the way in which this translates into daily life (<https://www.youtube.com/watch?v=IVPLluBy9CY>). Rhythmicity is also very apparent in babies even when still in utero (Trehub & Thorpe, 1989).

These examples demonstrate the links between rhythm, synchronicity and anticipation within which elements of pattern and movement through space create an element of predictability and order. According to Jirousek (1995), rhythms in sound/music are very similar to rhythmicity in visual composition, but the difference is that 'the timed beat is sensed by the eyes rather than the ears. She outlines three ways in which visual rhythm can be created. The first is linear rhythm, which is dependent on pattern but specifically on the timed movement of the eye of the subject; the second is repetitive rhythm, which gives a visual beat in the underlying structure of the picture; and the third is alternating rhythm in which repeating motifs are presented in turn (ibid). Therefore, it could be argued that one of the conditions of artistic form is a rhythmicity that is rooted deep in the world itself and, as Dewey notes, 'The first characteristic of the environing world that makes possible the existence of artistic form is rhythm' (Dewey, 2005/1934, p.153).

## **6.6 Summary**

In this chapter, I have elaborated further the connection between aesthetics and ecology, suggesting that it is through a symbiotic relationship between them that their impact is most efficacious. In exploring this relationship further, I have referred to the importance of liminality, symmetry and rhythmicity, explaining how each contribute to an onto-epistemology of aesthoecology.

Rhythm undoubtedly underlies all elements of our existence and is pervasive in that which we understand and interpret as nature or culture. The more we contemplate the existence of rhythm as a phenomenon, the more we can recognise its omnipresence as a binding force within all relationships. It is not surprising, therefore, that rhythm should be seen so strongly inherent in both aesthetics and ecology and should be considered as the matrix that binds them together within a symbiotic intimacy.

This displays the intimacy and synchronicity of the interaction between aesthetics and ecology. This symbiotic relational understanding at both the biological and sociological level challenges the normally accepted concept of individuality. A number of notable studies on the interactions between animals and plants with symbiotic micro-organisms disrupt the boundaries between



hitherto understood characteristics of the biological individual (e.g. Gordon, 2012; Margulis & Sagan, 2001). Gilbert et al. (2012) take this a step further and express the view that we have never been individuals.

If we take this at face value, there is a potential impact on the ways in which we understand and construct our societies, which reinforces the concept of intimate connectivity. This is not only between living things but also between the animate and non-animate world. This intimate connectivity assumes that there is no way of standing apart, and the somatic involvement of body and setting, and complex interaction of consciousness and culture, reject the idea of traditional dualisms such as those separating idea and object, self and others, nature and culture. This liminal condition of being on the edge of the new is an affective experience that brings me back to the formative experience I had in the art gallery in Venice (see section 2.6). I recognise now how examples such as this illustrate the characteristics of both affectivity and anticipation in shifting perceptions in a new and emergent way. I consider this in more detail in the next chapter.

# Chapter 7 – Aesthoecology as Affective Anticipation

## 7.1 Introduction

Imagining the notion of liminality through the features of time, place and the future in a radical and dynamic way appropriately expands a vision of nature that encapsulates what Prigogine and Stengers (1984, p.292) refer to as ‘a radical change toward the multiple, the temporal, and the complex’. In this chapter, I explore the notion of anticipation in relation to affectivity and particularly how, in educational terms, this might lead to understandings of an emergent future as opposed to one that extrapolates from the past (Osberg, 2018).

Anticipation might be considered in a number of different ways. I am particularly interested in the notion of anticipation within the symbiotic relationship between aesthetics and ecology, which I refer to as aesthoecology and describe in detail in Chapters 5 and 6. Aesthoecology constitutes an acute awareness of the wider world and simultaneously the immediate spaces that we inhabit and within which we interact.

The aesthetic aspect of this symbiotic relationship refers to our sensorium – the ways in which we affectively sense those spaces and beyond, our appreciation of them, the experiences that arise from them and the actions and reactions that result. The sensorium might be defined as ‘the total character of the sensory environment which together includes sensation, perception, and the interaction of information about the world around us’ (Duncum, 2012, p.183). I contend that the sensorium is at the basis of affective experiences that are deeply somatic and that arise from an anticipatory mode of being. Affective experiences are more than simply a passive reception of something from outside and, therefore, I believe that affect is concerned with potentiality and the changes that are made through the making and breaking of a myriad of connections and interconnections.

I explore the relationship between affect and anticipation in this chapter, in order to understand more fully the relationship between the past, present and future in

relation to educational experience. However, I suggest that affective anticipation does not exist as a separate concept but is embedded within, and central to, the broader onto-epistemology of aesthoecology.

## 7.2 What is anticipation?

According to Poli (2010, p.8), the most familiar, but not the only, definition of an anticipatory system is:

*a system containing a predictive model of itself/or its environment, which allows it to change state at an instant in accord with a model's predictions pertaining to a later instant.*

This definition represents a very mechanistic interpretation of anticipation, based on a teleological model of effectivity as opposed to one that relates to much more complex affective systems that act simultaneously and spontaneously. The teleological model, which relies on a normative linear approach to the future, does not accord with the emergent nature inherent in aesthoecology. It refuses to reflect the inter-connectedness and intra-connectedness of the nature of knowledge and its consequent complexity. The teleological model is based on notions of effectivity of the learning process through which knowing A leads to knowing B, the outcomes can be measured and the knowledge gained is wholly or mainly considered capable of predictability.

An extrapolatory approach to anticipation, one in which what happened before strongly predicts what will happen in the future, lies in this idea of cause and effect. What is it that elicits actions and reactions and appears to 'take its decisions in the present according to forecasts about something that may eventually happen?' (Poli, 2010, p.8). Many would accept this proposition if applied to the human species on the grounds that 'we are such highly complex and wonderfully sophisticated cognitive agents' (ibid). However, the notion of anticipation extends well beyond our species in a networked fashion incorporating all actants. Poli (2010) claims that anticipation is a widespread phenomenon apparent in all types of reality. He goes as far as to say,

*Life in all its varieties is anticipatory, the brain works in an anticipatory way, the mind is obviously anticipatory, societies and its structures are anticipatory, even non-living or non-biological systems can be anticipatory.*

(Poli, 2010, p.8)

The ubiquitous nature of anticipation brings to mind my very early fascination with animal behaviour, at which time I constantly asked myself why, when faced with choice, animals do one thing rather than another. Why, for example, do they turn right not left, go up not down, choose to confront and not to run away? When shoals of fish swim very fast in a cloud of extraordinarily co-ordinated movement, or a murmuration of starlings darkens the twilight sky with their amazing aerobatics, it is a rhythmic melding of aesthetics and ecology that seems to connect affective responses and anticipation in almost an instantaneous way.

This highly co-ordinated ability to react in the present, and carry something radically new into the immediate future, suggests that anticipation is more complex than just an extrapolation of what has happened in the past determining some sort of preconceived future. Yet anticipation as extrapolation has been a predictive approach taken by the education establishment over many years. I start by exploring this in the next section before suggesting alternative ways in which anticipation in educational contexts might be understood, particularly in relation to affectivity.

### **7.3 Anticipation in a normative educational context**

Anticipation in a normative educational context tends to rely on anticipation as extrapolation. This approach to education lends itself to a form of accountability, not only as a judgement on the students' learning, but also on the teacher's teaching and the performance of the organisation as a whole. Accountability procedures of this type were progressively adopted as policy in UK schools throughout the 1990s and embedded over the next 20 years.

David Milliband, for example, speaking at the North of England Conference in 2004, succinctly illustrates the framework of school accountability: 'We set ourselves the task of delivering an intelligent accountability framework, a

simplified school improvement process and improved data and information systems' (Milliband, 2004). More recently, the Department for Education in England has published a document that outlines the 'principles for a clear and simple accountability system', in which the accountability systems for educational principles are directed (DfE, 2018).

Central to this, is the school development plan (SDP) that requires a strategic directionality for improvement. A strategic plan of this type clearly represents some important features that rely on linear, anticipatory processes. For example, the guidance from the Northern Ireland Department for Education suggests that

*It should bring together, in a clear and simple way, the school's priorities, the main measures it will take to raise standards, the resources dedicated to these and the key outcomes and targets it intends to achieve. It will set out the overall 'roadmap' for the three years ahead, with a focus on the school's key priorities, identified following a process of self evaluation. It will be evidence based and clearly linked to the school's policies and action plans, but these do not have to be included in the actual SDP document itself. It should be a living document that all members of staff will use as a reference point in evaluating, developing and improving their work.*

(Department for Education, Northern Ireland, 2010, p.2)

This extrapolatory and normative approach to the future relies heavily on what has happened in the past. This requires an extrapolatory approach 'to anticipate possible futures by projecting, extending, or expanding known experience into areas not known or previously experienced, to determine what should or what needs to be done' (Osberg, 2018, p.6). This type of projection influences many other aspects of school life and pupil experience. For example, Grayson (2019, p.1), in a document written for the National Foundation for Educational Research (NFER), asserts that 'Where pupil performance is used as a high stakes accountability measure, there is a concern that schools feel constrained to prioritise those parts of the curriculum that are tested at the expense of others that are not.'

A linear approach to progression, in the case of a development plan, raises the issue of what the correct action for the future might be. How do we know and who decides? Questions of this sort, when I was a teacher, always made me

question the credibility of drawing up detailed development plans with targets and outcomes that attempted to predict the future at all, let alone for three, five or 10 years ahead.

Extrapolation of the past into the future assumes and infers some sort of envisioning of what is to come and how best to bring that about. Envisioning has been considered as an inherent, and important, process in the school development process (e.g. see Kolodziejczyk & Trzopek-Paszkiewicz, 2016; West-Burnham & Harris, 2015), but envisioning in the context of anticipation has problems in any determination of the future that assumes a linear projection from the past.

Osberg (2018) critiques two processes that raise the question of how anticipation may operate, while taking account of a sense of responsibility for the future. The first approach links the notion of anticipation with 'creative imaginings' (p.10). Osberg draws on Land and Jarman (1992), who rely on a strategy that envisions the future and then communicates this in order to inspire others. In this approach, there is a distinction drawn between a vision that may be achieved in common, but not generated in common. That is, these imaginings are not engendered or inspired in the classroom but by 'educational theorists, curriculum makers, politicians, and so on ...' and, therefore, Osberg proposes that

*...educational provision should, at the very least, include the possibility of generating creative imaginings for the future rather than only following the creative (but partisan and egotistical/hubristic) imaginaries of "external visionaries".*

(Osberg, 2018, p.11)

To counter this, therefore, a 'democratic imagining' might be deployed. Drawing on Ranciere (2010), Osberg (2018) recognises that political decisions need to be formulated because it is not feasible to move forward in many directions at the same time. Political decisions, therefore, must be seen as temporary and 'understood as a space which keeps open the possibility to imagine and pursue alternate futures' (Osberg, 2018, p.12). This space allows for constant reflection and questioning, but, according to Osberg, is suspect as it still relies on

externally decided views of what education should be for, and these envisioned futures are still 'instrumental and normative' (Osberg, 2018, p.13).

Consequently, neither creative imagining nor democratic imagining get away from these instrumental and normative concerns and both are in danger of 'projecting, extending, or expanding known experience into areas not known or previously experienced to determine what should or what needs to be done' (Osberg, 2018, p.6). Some understanding of anticipation is, therefore, sought that is not reliant on extrapolation or linearity.

## 7.4 Symbiotic, emergent and affective anticipation

To overcome the problems inherent in an extrapolatory and linear model of anticipation, Osberg (2018) draws on the notion of 'symbiotic anticipation', which she envisages in this way:

*The initiation of a symbiotic relationship might be described as not only an open-ended (playful, rather than instrumental or normative) experiment with what is not yet needed but also an experiment with the possibility of what is not yet possible. The not-yet-possible that I refer to here is not only not-yet-possible in practice (which implies it is possible in principle and can be imagined). I refer to a much stronger not-yet-possible, one which cannot yet be imagined. This does not mean, however, that a "symbiotic" stance is devoid of all reference to what is already (known to be) (im)possible.*

(Osberg, 2018, p.14)

I, too, have referred to symbiosis (see, for example, section 7, chapter 3) particularly in relation to aesthetics and ecology, conceiving the combination as aesthoecology. The importance of symbiosis has been recognised in contemporary biology, for example, in replacing the previously established position of individuality (Margulis, 1981; Gilbert et al., 2012). A symbiotic relationship is not just a combining of the characteristics of two entities; rather, in their combination, something new and unique emerges.

This radical newness can only be perceived when it comes into being and is enacted such that 'anticipation disappears the moment uncertainty is overcome' (Osberg, 2018, p.15). This moment of transition is important and is reliant on an affective way of being – a liminal state of openness and receptivity to change –

or, as MacCormack and Gardner (2018, p.11) suggest, 'affects are not concrete entities but rather self-constituting interfaces that generate both interiority and exteriority through affective encounters.'

The notion of symbiosis also draws attention to the richness of the relationship between human and non-human and the importance of relationality (Braidotti, 2019; Massumi, 2002). I would argue that this is reliant on an affective way of being and is in accordance with my notion of aesthoecology. I would describe this influence as affective anticipation in unifying perception, affect and action.

For example, this unity is reflected in the complexity of co-ordinated bodily movements. Sandra Reeve, a movement teacher, artist and psychotherapist, considers that

*My notion of the ecological body is based on the hypothesis that such a body perceives the moving world through movement and experiences itself as one part of part of a changing situation. As an ecological body engaged in ecological movement, I am aware of the effect that my movement is having on others and on the environment itself, and how they are conditioning my movement. Habitual characteristics and tendencies become apparent in movement patterns: they are the movements which repeat themselves through changing environments. With awareness, I contend, these can be accepted and then transformed by adopting new movement preferences or releasing the tension of a particular pattern and seeing what movement arises.*

(Reeve, 2011, p.50)

Manning and Massumi (2014) believe that movement feels like potential, which is inherently abstract by nature. By this, they mean in the sense of not yet being this or that, neither here nor there, in other words always potentially emergent. Analysis of movement, and the awareness of the links the body has to other bodies (human and other-than-human) and the environment, suggest to me the idea of constantly being on the edge of the new. This has an equivalence to liminality, a theory which I describe in detail earlier in the thesis and which entails being on the edge of awareness and in sensitive anticipation of the next event (see section 6.4). I see affective anticipation in the light of liminality (Conroy, 2004; Horvath et al., 2018) and as a pedagogy of emergent learning:

*one that drifts and moves along unanticipated flows of emergent learning traversing educands and educators, one in which spontaneous memories,*



*speculations, and projects of the participants may take centre stage regardless of whether they accord with pre-conceived end-points.*

(Nemirovsky, 2018, p.403)

Emergent learning is characterised by being largely unpredictable, not reducible to internal components and variables (e.g. see Davis & Sumara, 2006; Osberg, 2008; Osberg & Biesta, 2007, 2008). It is self-organising and creative and I conceive a difference between learning and education by postulating that education brings learning into consciousness. This recognises that learning is an inherent part of living but in education something happens to that learning that brings with it some sense of significance in the presence of others. This relationship between education and learning is brought to the fore by conceiving of a pedagogy of emergent learning.

In a posthuman sense, 'educators situate themselves in and as part of the world, defending an idea of knowledge production as embedded, embodied, affective and relational' (Braidotti, 2019, p.143). In this way, aesthoecology, and particularly the notion of affective anticipation, can play a significant role in relocating 'students and educators into the very world they are trying to learn about' (ibid).

## **7.5 Affective anticipation in practice**

An example of affective anticipation is my experience in the gallery in Venice, which I describe earlier in the thesis (Chapter 2, pp.34-37). The sensations that I experienced accord with the notion of affective anticipation. As I was in a new situation, the future was no longer a primary concern in any way, but it emerged as I experienced it. Two important realisations arise from this. Firstly, this was a non-normative experience; that is, I was in a new space within which I could have no expectations of the experience that was to follow. I was not visualising the future, but experiencing the present. Secondly, this experience did not arise from existing knowledge even though I was trying to make it do so.

Consequently, the experience was immersed in a confusion of the senses, possessed elements of synaesthesia (merging of the senses), and was fully emergent. I recognise now that this is entirely congruent with the notion of affective anticipation.

In more tangible ways, I can also relate this to educational situations that I have witnessed and been part of. Music education can be a very powerful influence throughout a school (see e.g. Custerdero, 2002; Elliot, 1995; Green, 2008; Webster, 1988). An orchestra and choir, set up within a context in which music had involved very few students previously, rose to prominence in a very short time at a school I worked in. All students, in a school of more than a thousand, were encouraged to play musical instruments and/or to sing in the choir. Despite initial reluctance among many, the numbers involved grew rapidly. Those who engaged with the project of adapting pieces of music, learning the instruments and planning concerts were transformed not only in their growing expertise in music but in their confidence overall.

Although the core of engaging with music might have been assumed to be the acquisition of skills, the more transformational nature of their interactions was of an affective nature. Although I have no objective data to support this, it is these sorts of experiences that have led me to consider the affective aspects of anticipation and to consider that affectivity and anticipation are congruent. The students' involvement in the practice rooms, working with people, instruments, music stands, microphones, chairs, the positioning of the orchestra on the stage – an intra-active involvement – was extended to other locations and spaces outside the school that were novel to them all. This was an all-encompassing, experimental experience, the results of which could never have been defined beforehand and which were complex and emergent. While it could be argued that individuals gained from the experience, it is the more complex, connected nature of the experience that I am now interested in.

I would extend this illustration of affective anticipation to other experimental situations and projects, examples of which I have described in Chapter 2. Each one of those created spaces within which experimentation could take place. The centre for children with ASD was established to fulfil a need and therefore had to have guiding principles and a justification for its existence. However, there was also a sense of it being transformative, not just for the children for whom the centre was provided, but in positively affecting culture in the school and the community. In that way, it was collaborative and experimental but without a preconception of what might emerge or how.

It is in retrospect that I realise the importance of moving towards transdisciplinarity that affirms the example of the space creation provided for the work mentioned above. The terms multidisciplinary, inter-disciplinary and trans-disciplinary may be used to imply, in increasing order, varying degrees of postdisciplinarity. Transdisciplinarity might be understood to transcend the restricted and bounded scope of disciplinary worldviews (e.g. Klein, 2015) and represent the emergent properties of collaboration.

The college's gallery and the centre for children with ASD were positioned to encourage interdisciplinary work. Adjacent and adjoining were the multidisciplinary student support team, the learning resource centre and the library provision with a hope, although I would not have been able to express it like this at the time, of moving towards postdisciplinarity. Braidotti (2019), drawing on Lykke (2018), suggests that

*Whereas multi- and interdisciplinarity work signifies collaborations within the framework of disciplines which enter into new synergetic relationships with each other, postdisciplinarity refers to more transgressive ways of producing knowledge.*

Braidotti, 2019, p.143

Postdisciplinarity was also apparent in the way in which the art gallery seemed to work in the college. This was a free space that any group could use for interacting with artefacts, pictures, objects or any other actants. Although envisaged for the visual arts, it stretched the interpretation beyond the boundaries of normative understandings of art education. In the words of Braidotti (2019, p.144), it was hoped that it might introduce 'a model of relationality and affect in education, in the sense of non-vertical and non-horizontal planes of encounter'.

On one occasion, a theatre group from Rwanda presented a production on genocide in the main school hall to a number of audiences. This was a stunning, emotional and thoughtful piece that had moved the audiences in ways they would not have expected. In itself, this was an example of affective anticipation. It involved all the senses. The reaction of the audience was palpable. The actors used dance, music, art and drama to tell their story. There was audience participation and interaction with the cast. The experiences of the

audience could not have been predicted, particularly those of students who in more conventional classroom situations would have had great difficulty concentrating. This interaction was synaesthetic learning for each individual in the process of which the sensory experiences came together and were shared in order to make sense with others. This brought learning into consciousness and was recognised as educational.

In the evening, the cast was invited to the gallery, where there were photographs relating to the performance, and cast members were thanked by staff, students and others for performing. Their way of appreciating the thanks was to start to dance and sing and fill the space of the gallery with their music, weaving in and out of the furniture and the sculptures and inviting everyone to join in. I remember people drumming on the seats and using materials around the gallery in rhythmic appreciation. These sorts of experiences cannot be planned. They emerge from the context of the space and the moment. They are consummate examples of affective anticipation.

## **7.6 Summary**

In this chapter, I have brought together ideas of affectivity and anticipation, illustrating, by reference to specific examples, how they work in educational contexts as affective anticipation. Affective anticipation, as I stressed earlier in this chapter, does not exist in isolation but is congruent within broader understandings of aesthoecology. The symbiotic nature of aesthoecology diffuses yet conjoins interactions between affectivity, rhythmicity and connectivity. I have discussed in detail, in Chapter 4, the ways in which these elements interact by reference to the 'trilobe synoptique'. This represents a complex, radiating and diffractive synaesthesia, which shows that affective experiences are inherently bound into the textual nature of the immediate environment. I have now, in this chapter, extended the affective experience to the context of anticipation.

I have also discussed how liminality is inherent within the relationship between affectivity and anticipation, leading to non-reversible and emergent moments of transformation. Liminal events might be described as dynamic, ecological and anticipatory. They are activated by affective responses, constituting an invitation

to transcend the limits of a single modality to explore the synaesthetic territory where any or all of the senses are employed to produce new meaning.

The building of reciprocal relationships within human and other-than-human communities and the dynamism and complexity of each living moment are the place where the symbiotic relationship between ecology and aesthetics constantly and continuously interacts. Thus, this dynamic relation between the two, this conspiracy to produce rhythmic, continuous and emergent change physically, temporally and somatically, represent a process of 'affective anticipation'. I contend that this aesthoecological understanding has far-reaching and significant influences on our understandings of education into the future.

# Chapter 8 – Conclusion and an Aesthoecological View of Education

## 8.1 Introduction

I started this research with the belief that aesthetics and ecology are important components in education, although currently this is not sufficiently well recognised. Both concepts have been represented in various ways in more normative contexts, within the arts or sciences for example, but not in a broader, more holistic way. My theoretical research has explored the various ways in which aesthetics and ecology can be understood as individual entities but – further than that – I have pursued, within a posthumanist and new materialist framework, the ways in which the influence of each can be magnified through a symbiotic relationship between the two.

My initial proposition for aesthoecology (Chapter 1, section.5) was:

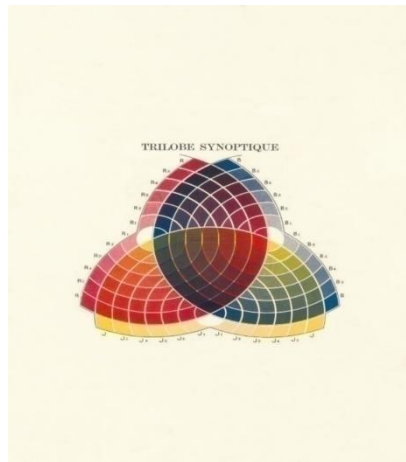
---

*Aesthoecology is the symbiotic and dynamic relationship between aesthetics and ecology, in which aesthetics represents the deep and often unconscious sensory awareness of being in the environment (our being in our environment), and the associated ecology, which represents a worldview as well as an intimate, unfolding and emergent understanding of the complexity, and immediacy, of our surroundings, which form our temporal landscape. Inherent in this, is the effect and affect that are predominant in the interaction between the two and the ways, often subtle, in which behaviours – actions, reactions – and consequences are elicited by the detection and emergence of individual and collective environmental changes.*

---

I am gratified at how accurate this proposition has turned out to be. I have deconstructed each element of the definition to support its claims through the literature, researched associated concepts (e.g. emergence, symbiosis, symmetry, liminality, synaesthesia) and illustrated how the onto-epistemology of aesthoecology might be applied to an education imperative.

Throughout this process of deconstruction and reconstruction, the initial notion of an aesthoecology has become substantiated. Aesthoecology represents a symbiotic relationship within which the individual elements of aesthetics and ecology cohabit the same territory and, through a distinct sense of rhythmicity, are able to generate new horizons. I claim that aesthetics, ecology and rhythmicity run deep in our biological and anthropological inheritance, and that the recognition of this results in a symbiotic synaesthesia, which is well, and simply, illustrated by the trilobe synoptique. In fact, if there were to be a visual image to represent aesthoecology, this might be it.



*Figure 15: 'Trilobe Synoptique', illustrating relationship between aesthetics, ecology and rhythmicity [Permission from The Pattern Book Company]*

The theoretical underpinning of the theory of aesthoecology is within an understanding of the posthuman condition. I do not claim that aesthoecology is a unique inheritance of the human species. It runs more deeply than that. It is a recognition of the interconnectivity and the dynamic interplay, a juxtapositioning, of all things, biological and material.

The importance of this relationship between aesthetics and ecology is in both the acute and chronic awareness of the spontaneous and emergent possibilities for change. This is reliant on the constant and all-pervading rhythmicity that mediates this. The important feature of aesthoecology is the deep learning that is brought into consciousness through this lens, both of the learner and the observer of learning.

I set out to capture a greater understanding of the inter-relationship between aesthetics and ecology and subsequently of the impact that this relationship, as aesthoecology, might have on the education imperative. To do so in this way, and to identify the connectivity between each of them, represents a distinct contribution to knowledge and a valuable intellectual and ontological foundation for further research in curriculum and pedagogy across a range of education settings.

## **8.2 Emergent values of aesthoecology**

Through the process of elucidating the notion of aesthoecology, its implicit characteristics have become very apparent. It is clear to me that aesthoecology represents a new and different ontology, founded on the principles of posthumanism and new materialism, for the exploration of our personal world and for recognising the implicit interconnectivity it possesses. This has significant implications for education within a rapidly changing world.

Aesthoecology adds value to an understanding of our global scale of existence and the impact, individually and collectively, we have on the future. This recognition has become even more prominent and important during the time that this thesis has been in progress. For example, climate change has recently become higher on the political and economic agendas due, in large part, to the action of one young person from Stockholm, Greta Thunberg (see e.g. Guardian profiles, 2019, <https://www.theguardian.com/profile/greta-thunberg>). This has stimulated radical action by school students across the world. It has simultaneously galvanised environmental groups to put pressure on governments. This is a political action and one that I would argue is aesthoecological. It has very distinctive affective and temporal qualities and operates through its resonance and connectivity. If successful, this action will have disturbed accepted ways of being and thinking and consequently could be described as simultaneously art, politics and education. Thus, aesthoecology impacts on a posthuman world within which relationships are extended to beyond the human, and difference is valued. Aesthoecology is about the creation of these ecological spaces, which respond to aesthetic sensitivity. This



raises the importance of the contextual power of the affective through a greater sensitivity and awareness.

Aesthoecology recognises that learning is a continuous activity and that education shapes that learning by bringing it into consciousness. This, too, is a contextual act – an ecological event – which is inherent within a zone of liminality and brings into being an individual, personal and collective aesthoecological literacy. This literacy arises from some sense of pedagogical beauty, which encapsulates political and democratic integrity and the power of transformation through difference. The important element of this pedagogical beauty, perhaps brought to consciousness through aesthetic chills (McCrae, 2007), is the sense of awareness that comes through this – an openness to new experience and the confidence to make sense of it:

*Thinking experience as an open and immanent whole acknowledges that each new event of experience will transform what experience is thereby precluding in principle any final or closed ground for experience.*

(Colebrook, 2002, pp.78-79)

So, my theoretical and autoethnographic research is about the nature and culture of change. It accepts that change is inevitable and is an essential element of learning. However, the way in which that change is mediated and the ways in which learning is modified become an essential part of the concept of aesthoecology as I have described it. While the theoretical research behind the ideas of aesthoecology has recognised these processes of change, in the same way the pursuance of this onto-epistemology has brought about profound personal change in me. Aesthoecological awareness, on a series of different levels, is detected through multiple modalities, a synaesthesia, each impinging on and overlapping the other and, therefore, far from being contemplative, our affective and connected condition simultaneously collaborates to recognise the past and to welcome the emerging future.

### **8.3 Contribution to knowledge**

I contend, from my personal and professional experience, that aesthetics and ecology play a significant part in every landscape of education and should be at

the core of pedagogical thinking at the level of the student, the teacher and the policy maker. The ontology of aesthoecology can be influential in epistemology, determining curricular, structural and pedagogical decisions.

Aesthetics and ecology, generally as separate entities, have been discussed in relation to education by a number of authors and I have drawn on their work where appropriate (e.g. Constantino & White, 2010; Lewis, 2014; Louv, 2012; Osberg & Biesta, 2018; Schiller, 2012; Sterling, 2001; Stone & Barlow, 2005; Zandvliet, 2013). This discourse tends to be related to the curriculum dimensions of art, science and the environment respectively, and to the pedagogy of transdisciplinarity (e.g. Chappell et al., 2019; Norden, 2018). Outside the field of education research, there are extensive studies of both aesthetics and ecology within a wide range of different contexts (e.g. Bennett, 2010; Collingwood, 1960; Demos, 2016; Hegel, 1993; Koren, 2008; Latour, 2018; Morton, 2009, 2012; Ranciere, 2004, 2009, 2013). These represent substantial fields of theory and practice. I have, of course, drawn on those discourses. These concepts have been discussed, mainly as separate entities, within politics and philosophy, for example, and as a combined entity in relation to architecture. I have enthusiastically drawn on these bodies of knowledge, particularly using architecture in a metaphorical sense (Kurokawa, 1991; Ruskin, 1960; Tuan, 1977).

What is new about the contribution I am making to education discourse is the way in which I have argued the value of aesthetics and ecology within a symbiotic and profound relationship. I have acknowledged and appropriately apportioned the immense influence I believe that aesthetics and ecology play in education theory and practice. But, from this arises the potential for a new and dynamic education discourse, which I consider to be inherent in an aesthoecology. This recognises profound and radical shifts of opinion in relation to a posthuman world within which significant numbers of young people recognise a growing divergence from traditional ways of doing things to the truly new that few of our current epistemological constructs have anticipated.

Consequently, I believe that my thesis on *Education as Aesthoecology* makes a distinct and new contribution to defining some of the challenges in education discourse, but, more importantly, constructing a philosophical and theoretical

framework from which radical solutions might emerge, which challenge the status quo and confront a future that we can only, as yet, anticipate.

## **8.4 Further research and recommendations for policy and practice**

I hope that the theories of aesthoecology may interest, even excite, researchers and practitioners of education now and into the future. Representations of aesthetics and ecology, as it has been argued, have frequently been used within specific areas of education. What is new is the relationship between them, particularly in relation to the notion of rhythmicity, which is an area which has had some attention directed to it in the work of Lefebvre (2013), Alhadeff-Jones (2018) and Lyon (2019). I believe there is more to be done within this field, particularly in an aesthoecological context, in which attention is paid to the affective, connected and temporal aspects of pedagogy.

In this thesis, I have frequently referred to architecture, as much in a metaphorical sense as in a literal sense. The architect, too, works with the interplay between aesthetics and ecology. Tschumi (1996) understands this to be exemplified by ‘that of the form giver, the creator of hierarchical and symbolic structures characterized, on the one hand, by their unity of parts and, on the other, by the transparency of form to meaning’ (Tschumi, 1996, p.207). This description is worthy of further exploration in relation to education, particularly concerning ‘the fusion of form and function, program and context, structure and meaning’ (ibid). This critically represents ‘the unified, centered, and self-generative subject, whose own autonomy is reflected in the formal autonomy of the work’, which accentuates ‘synthesis, harmony, the composition of elements and the seamless coincidence of potentially disparate parts’ and ‘becomes estranged from its external culture, from contemporary cultural solutions’ (ibid).

These architectural analogies also relate to the burgeoning field of education within a posthuman context, so vital to any interpretation of aesthoecology. Whether this is in relation to decolonisation (e.g. Pirbhai-Illich et al., 2017), transdisciplinarity (e.g. Chappell et al., 2019) or posthuman research methodologies (e.g. Taylor & Gannon, 2018), there will be not just a need, but an appetite, for alternative frameworks to be adopted. This represents an

exciting time for novel education research approaches, and aesthoecology must share a place in this future.

My own personal interest will be in the relationship and applications of aesthoecology to places of education, such as museums and galleries. I have already indicated in Chapter 4 the potential that this may present and the transdisciplinary approaches that might be adopted. That which emerges may well prove transferable to other contexts, thus broadening the applications to a range of settings.

I am interested in the ways in which education can respond rapidly to the effects of the climate crisis that is upon us. Aesthoecology provides an opportunity to frame this response and to assist young people and their educators in their personal and collective preparation. This is an example of education needing to respond rapidly and differently to an emerging hyperobject (Morton, 2013) and to take an approach that is simultaneously aesthetic and ecological. In order to do this, radical change to organisations of education are required, including curricula that are inspired by entangling the conventional strands of learning, a pedagogy that recognises the complexity of knowledge formation, a philosophy that understands the implications of an unknown and risky future and a care that fosters the enchantment and fragility of the world and all within it. Aesthoecology supports these dimensions of dynamic change.

These dimensions are already apparent in the education research literature:

*Today we stand at the precipice of a world undergoing radical climatological and environmental change. Growing consensus suggests we have entered a new era marked by unprecedented rates of human activity on the planet and planetary ecosystems. Dubbed the Anthropocene, this new era of climatological precarity poses a host of emergent challenges for education, educational research and the very meaning of schooling.*

(Wallin, 2017, p.1099)

These global challenges need to be addressed, and the role that education can play must not be underestimated. This is not just a scientific and meteorological issue. Posthumanism also redefines our understanding of the human within education theory and has significant implications within education research and curriculum design. (Snaza & Weaver, 2015; Taylor & Hughes, 2016). This is

absolutely where the onto-epistemology of aesthoecology is relevant, to frame or underpin pedagogical interactions and the ways in which knowledge might be understood.

## **8.5 Final words**

I argue that aesthoecology provides a greater clarity to the ways in which aesthetics and ecology can come together in order that a new onto-epistemology becomes apparent. Thus, education might be viewed in a different way – a way in which the pressing issues of our time might be framed for them to be addressed differently. This means a break from our current cultural traditions within education and beyond. Now and then are not separate, here and there are not separate; it cannot be seen where one starts and the other begins. They are like the mobius strip, which interminably intertwines with one face and becomes the other in a rhythmic spiral. The nature of the twisting and of the spiral gives it an energy in which there is a familiarity and yet always the newness of becoming. As in the river, which I use frequently as a metaphor, there is constant change and yet a reassuring familiarity. It possesses a symmetry, and yet its power to transform lies in the breaking of the symmetry. The juxtaposition of one to the other provides the power of change and the anticipation of emergence.

The research leading to the writing of this thesis developed in these ways. It challenged my original proposition, and it transformed the way in which I perceive education by being, in itself, an education.

# Glossary

**Actants** – represent the individual elements of a network and these could be human, non-human or material, each of which is essential if the network is to operate.

**Aesthetics** – is concerned with notions of beauty and the sublime and most recently with the philosophy of art. In terms of this thesis, it pertains to sensitivity and sensibility and encounters with others and the environment. It is in this sense that it is linked to ecology.

**Aesthoecology** – represents the symbiotic relationship between aesthetics and ecology, often considered to be mediated by a rhythmicity, which recognises our diverse sensory connectivity with space, place and time.

**Aisthetics** – is similar to aesthetics but more specifically is concerned with perceptual awareness and sensation as opposed to intellectualisation. It is associated with feelings and affect.

**Affect** – is an emotional response to a situation or stimulus. Defined by Gregg and Seigworth (2010, p.1), it ‘arises in the midst of *in-between-ness* ... an impingement or extrusion of a momentary or sometimes more sustained state of relation *as well* as the passage (and the duration of passage) of forces or intensities.’

**Anticipation** – represents an attitude of looking forward as well as the use of this attitude to take action. It involves changing state according to some sense of prediction of a later instant – futures thinking.

**Anthropocene** – is the most recent geological period, which has been significantly influenced by the actions of the human species. Evidence suggests that there is now no part of the planet that has not been altered by the action of the human species.

**Anthropocentric** – represents an attitude or culture in which the human is consistently considered to be at the centre of all activity.

**Anthropomorphic** – is the state of attributing human emotions, characteristics and behaviours to other living things, material objects or natural phenomena.

**Assemblage** – is a term that can be conceptually difficult, but a relatively straightforward definition is used by DeLanda (2016, p.1) from Deleuze and Parnet (2002, p.69): ‘It is a multiplicity which is made up of many heterogeneous terms and which establishes liaisons, relations between them, across ages, sexes and reigns – different natures. Thus, the assemblage’s only unity is that of co-functioning: it is a symbiosis, a “sympathy”. It is never filiations

which are important, but alliances, alloys; these are not successions, lines of 'descent, but contagions, epidemics, the wind."

**Autoethnography** – is a qualitative research approach that describes and analyses personal experiences in order to further understand philosophical, cultural or critical theory. This approach uses both autobiography and ethnography, and the methodology is consequently both process and product.

**Autopoiesis** – is a process that reproduces itself from within and is considered primarily as a biological system. However, it might also be a process that can be applied to societal systems, interactional systems and organisational systems. Autopoietic systems are closed systems and, therefore, although operating from within, they can be disrupted or perturbed by inputs from the environment that might trigger internal changes in the system.

**Beauty** – represents the property, quality or state of pleasing by being perceived. It is far more complicated than that. It might be considered an ultimate value like truth or goodness, but it has come to involve judgements such as taste and comparison – i.e. can one thing be more beautiful than another? It may be seen to have ultimate value that is pursued for its own sake.

**Blastula** – following fertilisation, a zygote is formed that undergoes multiple cell division to form a ball of cells, which is known as the blastula. The zygote displays radial symmetry.

**Bricolage** – is, in general terms, the construction of a work from a variety of available materials. However, the term has now been used in many other disciplines and across disciplines, including education, anthropology, philosophy and critical theory. In education, it is used to describe multimethodological enquiries, more properly recognising the complexity of knowledge production and social epistemology.

**Complexity** – is a term that is difficult to define, but it is composed of specific characteristics. It tends to be self-organising and emergent in that the properties exceed the sum of the component parts, giving rise to new patterns of activity. They show an ability to adapt within dynamic contexts and are, therefore, more evolutionary than mechanical. Equilibrium and steady state are not characteristics of complex systems. (For education contexts, see Davis & Sumara, 2006; Osberg & Biesta, 2010.)

**Culture** – relates to the beliefs, social norms and material traits of a particular group of people. It might specifically refer to artistic or intellectual endeavour, spiritual development, symbolic practices or a specific way of life. In a posthumanist world, the notion of culture would extend well beyond the human species and to incorporate the material world within an assemblage, for example.

**Bifurcation** – is the point at which something divides into two.

**Bildung** – a contemporary perspective might mean a conventionally instrumental education, but its deeper interpretation is much more holistic referring to the aesthetic – one of self-realisation, enrichment and the cultivation of the intellect for its own sake as opposed to serving another purpose.

**Diachrony** – represents the development of a language through time.

**Dissensus** – generally refers to a lack of consensus, i.e. agreement, but dissensus means more than the opposite, i.e. disagreement. In more abstract terms, it refers to a difference within the same, a division, and Ranciere (2013), for example, refers to Dissensus in terms of aesthetics and politics and conceptual leaps of sensory understanding.

**Dissipative** – is a term borrowed from theories of thermodynamics. Dissipative systems are open systems that operate far from equilibrium and give rise to emergent new properties and the breaking of symmetry.

**Ecology** – was originally a branch of biology that was concerned with the relationships between organisms and their environment. It has now been extended to include the complex web of relationships in any situation.

**Effective** – is the successful achievement of outcomes that requires some predefined process and desired end point.

**Emergence** – derives from the Latin and means to arise or to come forth. It represents a novel property of a system that arises at a particular point of complexity of the system. It then exists as a separate entity from that from which it arose.

**Enlightenment** – refers to a period in the 18th century, which centred on reason as the founding basis of knowledge. This resulted in an emphasis on scientific method and reductionism.

**Epistemology** – refers to both the nature of knowledge and the extent to which anything can be known.

**Ethereal** – represents something that is light or airy, often considered to be related to the celestial; something which is difficult to grasp; subtle and poetic.

**Eurhythmia** – is the holistic sense of pleasure and harmony in rhythm. It may be the superimposition of a number of interconnected rhythms.

**Eurhythmics** – was a term adopted by Jaques-Dalcroze (1865–1950) to ‘provide educators with a detailed method to conceive a pedagogy articulating movement, artistic practice and personal development’ (Alhadeff-Jones, 2018, p.95).

**Gastrula** – is the stage in the development of the embryo when there is a re-organisation of the cells from the spherical form of the blastula to a more



bilateral form from which the more complex organisation of the body arises. The change from blastula to gastrula is a form of symmetry breaking.

**Holistic** – is a theory that is concerned with wholes as opposed to the individual parts. In holistic systems, all aspects are taken into consideration, and the whole is considered greater than the sum of the parts. Holism reflects complexity rather than reductionism.

**Homeostasis** – represents the physiological systems in animals that allow for relative constancy in the internal environment of the animal. This has the advantage of buffering against changes in the external environment.

**Hyperobjects** – is a term coined by Timothy Morton (2013), representing things that 'are massively distributed in time and space relative to humans' (Morton, 2013, p.1). Morton claims that they are viscous in the sense that they do not go away, they are non-local in that the effects can be felt from afar, they have different temporalities and they can be detected 'in a space that consists of interrelationships between the aesthetics of objects' (ibid).

**Interstitial** – refers to the space between objects.

**Intuition** – is the ability to access knowledge without necessarily understanding how that knowledge was acquired. This may be a subconscious process, a general feeling, often thought of as insightful or instinctive.

**Liminality** – refers to a transitional phase or a threshold between one state of being to another. In biology, it might be the shoreline of a lake or the edge of a river; in anthropology it represents a rite of passage between one stage of life and another. It may be referred to as 'betwixt and between'.

**Metamorphosis** – is a profound change in an organism, marking one morphological form to another. In more general terms, it may refer to any significant period of change.

**Metaphor** – is a figure of speech in which a previously unknown idea is illuminated by reference to something that is known or which helps to explain an idea by reference to something known. This suggests a likeness or analogy between them. For example, 'blanket of snow', 'life is a journey'.

**Natural history** – is an area of study concerned with the behaviour and ecology of organisms within their environment but from an observational mode of enquiry as opposed to experimental and quantitative investigation.

**Nature** – is, strictly speaking, the collective of all organisms, geology and inorganic form and their consequent relationship with the earth. However, it also has heavy undertones of the aesthetic, including beauty and the sublime. It may be anthropomorphised and features in much of the Romantic era of literature and art. It is a highly debatable area, particularly in a posthumanistic domain.

**New materialism** – represents a reappraisal of the way in which matter is considered and its significance to ethics, ecology and politics. It raises important questions about ‘the nature of matter and the place of embodied humans within a material world’ (Coole & Frost, 2010, p.3).

**Object Oriented Ontology** – also known as OOO, claims that all objects are of equal importance and come in two types. Real objects exist in their own right, whether or not they influence or affect other objects. Sensual objects exist only in relation to other objects. There is, therefore, a tension between these different types of objects and their properties. Time and space are important with regard to the relation between these objects. The philosophy of OOO is considered to have a closer relationship with aesthetics than with mathematics or natural science (Harman, 2018).

**Organic** – is the state or process of being or becoming from living plants or animals.

**Pedagogy** – refers to teaching, most commonly the theory and practice of education.

**Phenomenology** – is a philosophical approach to the study of experience. It centres on what the experience of being a human is like and how we come to understand this. The development of phenomenology centres on the work of four philosophers: Husserl, Heidegger, Merleau-Ponty and Sartre (Smith et al., 2009).

**Posthumanism** – represents a shift in thinking from humanism, which prioritises the human as the universal state, to one which recognises the heterogeneity of the human condition. This includes both the emergent nature of the human and a changed perspective on the relationship between the human and other species and the inanimate world.

**Poststructuralism** – emphasises the plurality of meaning and arises from criticism of both structuralism and phenomenology. It rejects the structuralist binary approach and is rooted in both critical theory and linguistic theory. Poststructuralists would argue that to understand an object (e.g. a piece of literature) it is both the object and the systems that led to the production of the object that need to be understood.

**Rhizome** – has a traditional botanical meaning as a subterranean plant stem that puts out both roots and shoots from along its length, and these exploit gaps and spaces within the soil. The characteristics of this plant are adopted philosophically by Deleuze and Guattari (2013) as a metaphor for illustrating notions of multiplicity and heterogeneity and for its non-hierarchical nature. This is in contrast to the commonly used metaphor of the tree with its vertical and linear structure of roots and branches, which divide in a binary fashion.

**Rhythmicity** – relates to the response to rhythm that is an inherent property of the universe and at its most fundamental is concerned with co-ordination and regulation with the environment of living and non-living entities. Rhythmicity is a way of entrainment, but also of emergence when rhythms break and create something new.

**Rhythmanalysis** – is a methodology, or at least an orientation, for researching or analysing rhythm in the social sciences. It is an investigative tool developed by Henri Lefebvre (2013) as an invitation to think rhythmically and is now considered useful in a wide range of humanities disciplines including education (Alhadeff-Jones, 2018).

**Somatic** – relating to the whole body, or parts of the body, either in a medical context or, more philosophically, as an affective response to environmental stimuli. In that way, it possesses both aesthetic and ecological connotations.

**Symbiosis** – traditionally this represents a relationship between two or more organisms in which both or all benefit from the relationship equally. This can be compared with parasitism in which one partner benefits at the expense of the other. A classic biological example of symbiosis is the lichen, which is a relationship between a fungus and a lichen in which both gain essential benefit.

**Symmetry** – refers to a shape or an object in which different parts may be moved but there is no change to the overall shape. It may take many forms and often refers to a sense of harmony or proportional beauty and hence its role in the theories of nature. Symmetry is concerned in mathematics with invariance and transformation and, as a concept, is used widely in, for example, art, architecture and music. In this way, it has relevance to aesthetics.

**Symmetry breaking** – is a term used when a stable symmetrical form comes under tension, finally breaking the symmetry and spontaneously producing any one of a number of novel, emergent forms that then find their own stability.

**Synaesthesia** – is a reported condition in which the stimulation of one sense involuntarily triggers one or more of the other senses in association. This is based on little research evidence and is primarily reported as either a neutral or pleasant experience. It is also sometimes reported as being confusing in eliciting stimulus overload similar to that exhibited by those on the autism spectrum. Developing synaesthetic sensitivity may be seen as having educational benefit.

**Synchrony** – is where two similar things come together at the same time and a sense of mutuality is engendered.

**Teleology** – is a term that contends that natural processes have a telos, which is a goal or purpose. Therefore, all natural activity is in progress to achieve that predetermined aim. Teleology, therefore, negates ideas of spontaneity and

emergence. In a more modern context, it has led to ideas such as mechanistic planning, pre-determined outcomes and linear target setting,

**Temporality** – relates to the notion of time and the classical ideas of the linearity of time i.e. past, present and future, although different concepts of time have been considered during the last century. The notion of time in some analyses relates to ideas of rhythmicity and to environmental regulation of biological clock mechanisms.

**Transdisciplinarity** – represents an approach that transcends interdisciplinary or multidisciplinary and is more suitable in considering the complexity of disciplines such as education. In research, it is a term that recognises a team approach in which individual members come from different backgrounds but are sufficiently informed such that value is added to the collective. This might prove a particularly useful approach to studies that adopt a posthumanist philosophy.

**Transformational** – refers to the process of structural change from one form to another or from one set of characteristics and behaviours to another.

**Vital materiality** – is a term coined primarily by Jane Bennett in her book, *Vibrant Matter – A Political Ecology of Things* (2010). She proposes that all matter is to some extent alive through interconnected processes and thus matter creates and shares its own vitality or energy. This is a proposal that has far-reaching implications for the way in which the human relates to its environments and dissolves the binary divisions between subject and object.

**Zeitgeber** – are external cues that synchronise internal biological clock mechanisms in organisms with environmental stimuli such as light.

**Zoology** – is a branch of biology specifically concerned with the scientific study of all aspects of the life of animals and their relationship with the environment.

# Bibliography

- Aaronovitch, D. (2004) The thinking classes: Too clever by half. Observer comment, *The Observer*, September 12<sup>th</sup> 2004.
- Abbott, E. A. (1992) *Flatland – A romance of many dimensions*. New York, NY: Dover. (First published 1884 under pseudonym of A. Flatland).
- Abbott, L., & Nutbrown, C. (2001). *Experiencing Reggio Emilia – implications for pre-school provision*. Buckingham, England: Open University Press.
- Abram, D. (2017). *The spell of the sensuous*. New York, NY: Vintage.
- Adam, B. (1995). *Timewatch: The social analysis of time*. Cambridge, England: Polity.
- Adam, B., & Groves, C. (2007). *Future matters: Action, knowledge and ethics*. Leiden, Germany: Brill. <https://doi.org/10.1163/ej.9789004161771.i-218>
- Alhadeff-Jones, M. (2018). *Time and the rhythms of emancipatory education – Rethinking the temporal complexity of self and society*. London, England: Routledge.
- Aman, R. (2017). *Decolonising intercultural education: Colonial differences, the geopolitics of knowledge and inter-epistemic dialogue*. London, New York: Routledge. <https://doi.org/10.4324/9781315616681>
- Amsler, S. & Facer, K. (2017). Contesting anticipatory regimes in education: exploring alternative educational orientations to the future. *Futures: The Journal of Policy, Planning and Future Studies*. (Pre-print version) <http://www.sciencedirect.com/science/article/pii/S001632871630177X>
- Anderson, D. (2000). Conceptual framework. In A. Chadwick & A. Stannett (Eds.), *Museums and Adult Learning: Perspectives from Europe*. Leicester, England: NIACE.
- Andre, L., Durksen, T. and Volman, M. (2017). Museums as avenues of learning for children: A decade of research. *Learning Environments Research* 10984-016-9222-9. <https://doi.org/10.1007/s10984-016-9222-9>
- Ansell-Pearson, K. (2018). *Bergson – Thinking beyond the human condition*. London, England: Bloomsbury.
- Appiah, K. A. (2018). The myth of meritocracy. *The Guardian*, 19<sup>th</sup> October 2018.
- Argyris, C. & Schön, D. (1996). *Organizational learning II – Theory, method, and practice*. Reading, MA: Addison-Wesley.
- Aspin, D. N. and Chapman J. D. (2001) Lifelong learning: Concepts, theories and values. *Proceedings of the 31<sup>st</sup> Annual Conference of SCUTREA*, 38–41, University of East London, SCUTREA.

- Atkinson, P. (1990). *The ethnographic imagination: Textual constructions of reality*. London, New York: Routledge.
- Bachelard, G. (2014). *The poetics of space*. New York, NY: Penguin Books.
- Bagnall, R. G. (2009). Lifelong learning as an idea for our times: An extended review. *International Journal of Lifelong Education*, 28(2), 277–285.  
<https://doi.org/10.1080/02601370902805395>
- Bakhtin, M. M. (1981). *The dialogic imagination: Four essays*. M. Holquist (Ed.). Austin, TX: University of Texas Press.
- Ball, A. H. R. (Ed.). (1931). *Selections from the prose works of William Morris*. Cambridge, England: Cambridge University Press.
- Barad, K. (2003). Posthumanist performativity: Towards an understanding of how matter comes to matter. *Signs (Chicago, Ill.)*, 28(3), 801–831.  
<https://doi.org/10.1086/345321>
- Barad, K. (2007). *Meeting the universe halfway*. Durham, London: Duke University Press. <https://doi.org/10.1215/9780822388128>
- Barad, K. (2014). Diffracting diffraction: Cutting together apart. *Parallax*, 20, 168–187.
- Barr, J. (2005). Dumbing down intellectual culture: Frank Furedi, lifelong learning and museums. *Museum & Society*, 3(2), 98–114.
- Barradell, S., & Kennedy-Jones, M. (2015). Threshold concepts, student learning and curriculum: Making connections between theory and practice. *Innovations in Education and Teaching International*, 52(5), 536–545.  
<https://doi.org/10.1080/14703297.2013.866592>
- Barrett, E. & Bolt, B. (Eds.). (2013). *Carnal knowledge – Towards a new materialism through the arts*. London, England: I.B.Taurus.
- Bateson, G. (1972). *Steps to an ecology of mind*. Chicago, IL: University of Chicago Press.
- Bateson, N. (2016). *Small arcs of larger circles*. Axminster, England: Triarchy Press.
- Baumgarten, A. (1735). *Meditationes*, CXVI, 86–87.
- Beane, J. A. (1995). Curriculum integration and the disciplines of knowledge. *Phi Delta Kappan*, 76(8), 616–622.
- Beardsley, M. (1958). *Aesthetics*. Indianapolis, IN: Hackett.
- Beardsley, M. (1981). *Aesthetics: Problems in the philosophy of criticism*. Indianapolis, IN: Hackett.
- Beare, H. (2001). *Creating the future school*. London, England: Routledge Farmer.
- Bennett, J. (2010). *Vibrant matter – a political ecology of things*. Durham, London: Duke University Press.

- Berger, J. (1972). *Ways of seeing*. London, England: Penguin.
- Bergeson, T. R., & Trehub, S. E. (2006). Infants perception of rhythmic patterns. *Music Perception*, 23(4), 345–360. <https://doi.org/10.1525/mp.2006.23.4.345>
- Bergson, H. (1913). *Time and free will*. London, England: George Allen.
- Bergson, H. (1922). *Creative evolution*. London, England: Macmillan.
- Berleant, A. (1991). *Art and engagement*. Philadelphia, PA: Temple University Press.
- Berleant, A. (1992). *The aesthetics of environment*. Philadelphia, PA: Temple University Press.
- Berleant, A. (1993). The aesthetics of art and nature. In S. Kemal & I. Gaskell (Eds.), *Landscape, natural beauty and the arts*. New York, NY: Cambridge University Press. <https://doi.org/10.1017/CBO9780511554605.011>
- Berleant, A. (2000). *The aesthetic field – A phenomenology of aesthetic experience*. Christchurch, NZ: Cybereditions.
- Berleant, A. (2010). *Sensibility and sense – The aesthetic transformation of the human world*. Exeter, England: Imprint Academic.
- Biesta, G. J. J. (2006). *Beyond learning*. Boulder, Colorado: Paradigm.
- Biesta, G. J. J. (2010). *Good education in an age of measurement – ethics, politics, democracy*. Boulder, Colorado: Paradigm.
- Biesta, G. J. J. (2013). *The beautiful risk of education*. Boulder, Colorado: Paradigm.
- Biesta, G. and Tedder, M. (2006). How is agency possible? Towards an ecological understanding of agency-as-achievement. *Working paper 5, Exeter, The 'Learning Lives' Project*.
- Blumenthal, A. (1936). The nature of culture. *American Sociological Review*, 1(6), 875–893. <https://doi.org/10.2307/2084614>
- Bobek, E. & Trevsky, B. (2016). Creating visual explanations improves learning. *Cognitive research: Principles and Implications*. 1(27). Doi: 10.1186/s41235-016-0031-6.
- Bochner, A. P., & Ellis, C. (Eds.). (2002). *Ethnographically speaking – Autoethnography, literature and aesthetics*. Walnut Creek, CA: Altamira Press.
- Bochner, A. P. & Ellis, C. (2016). *Evocative Autoethnography: Writing lives and telling stories*. New York, NY: Routledge.
- Bollnow, O. (1961). Lived space. *Philosophy Today*, 5(1), 31–39. <https://doi.org/10.5840/philtoday1961513>
- Bond, M. (2013). Exploring our love/hate relationship with Gaia. *New Scientist*, 21.

- Bonnett, M. (2004). *Retrieving nature – Education for a post-humanist age*. Oxford, England: Blackwell.
- Bordieu, P., & Darbel, A. (1991). *The love of art: European art museums and their public*. Cambridge, England: Polity Press.
- Bornstein, R. F., & D'Agostino, P. R. (1992). Stimulus recognition and the mere exposure effect. *Journal of Personality and Social Psychology*, 63(4), 545–552. <https://doi.org/10.1037/0022-3514.63.4.545> PMID:1447685
- Boshier, R. (2000). Running to win: The contest between lifelong learning and education in Canada. *New Zealand Journal of Adult Learning*, 28(2), 6–28.
- Boulter, S. (2017). Education from a biological point of view. *Studies in Philosophy and Education*, 36(2), 167–182. <https://doi.org/10.1007/s11217-016-9509-4>
- Braidotti, R. (2013). *The posthuman*. Cambridge, England: Reality Press.
- Braidotti, R. (2016). The contested posthumanities. In R. Braidotti & P. Gilroy (Eds.), *Contesting Humanities*. London, England: Bloomsbury.
- Braidotti, R. (2018). A theoretical framework for the critical posthumanities. *Theory, Culture and Society*, doi.org/10.1177/0263276418771486.
- Braidotti, R. (2019). *Posthuman knowledge*. Cambridge, UK: Polity.
- Braidotti, R., & Bignall, S. (Eds.). (2019). *Posthuman ecologies – Complexity and process after Deleuze*. London, England: Rowman and Littlefield.
- Brady, J. (Ed.). (2016). *Elemental – an arts and ecology reader*. Manchester, England: Gaia Project Press.
- Brede, J., Remington, A., Kenny, L., Warren, K., & Pellicano, E. (2017). *Excluded from school: Autistic students' experiences of school exclusion and subsequent re-integration into school*. *Autism & Developmental Language Impairments*, 2, 1–20). <https://doi.org/10.1177/2396941517737511>
- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.
- Bruner, J. (1990). *Acts of meaning*. Cambridge, MA: Harvard University Press.
- Burnard, P., (2006). Reflecting in the creativity agenda in education. *Cambridge Journal of Education*, 36(3), 313–318. <https://doi.org/10.1080/03057640600865801>
- Butler, J. (2015). *Senses of the subject*. New York: Fordham University Press.
- Bynner, J. (2016). Whatever happened to lifelong learning? And does it matter? *Journal of the British Academy*, 5, 61-89.
- Cahn, S. M., & Meskin, A. (2008). *Aesthetics – A comprehensive anthology*. Oxford, England: Blackwell.



- Callicott, J. (1994). Toward a global environmental ethic. In M. Tucker & J. Grim (Eds.), *Worldviews and Ecology*, pp (pp. 30–40). Maryknoll, NY: Orbis.
- Campaner, B. (2009). Body attitude(s): The performative in the mediation of performance art. In C. Morsch (Ed.), *Documenta 12 education – Between critical practice and visitor services*. Zurich, Switzerland: IAE.
- Carlson, A. (1984). Nature and positive ethics. *Environmental Ethics*, 6(1), 5–34. <https://doi.org/10.5840/enviroethics19846114>
- Carter, B. (2008). Dewey, the OECD and differing discourses of ‘lifelong learning’. *New Zealand Journal of Adult Education*, 36(2), 110–117.
- Cassirer, E. (1945). Reflections on the concept of group and the theory of perception. In Cassirer, E. (1979) *Symbol, Myth and Culture* (pp. 271–295). New Haven, CT: Yale University Press.
- Cawley, V. (2010). The synaesthete: A new type of “gifted student” and how to teach them. *Procedia – Social and Behavioural Sciences*, 7, 574–579.
- Ceder, S. (2015). *Cutting through water: Towards a posthuman theory of educational relationality*. Unpublished doctoral dissertation: Sweden, Lund University.
- Chadwick, A., & Stannett, A. (Eds.). (2000). *Museums and adult learning: Perspectives from Europe*. Leicester, England: NIACE.
- Chappell, K., Cremin, T., & Jeffrey, B. (2015). *Creativity, education and society – Writings of Anna Craft*. London, England: Trentham IoE Press.
- Chappell, K. (2018). From wise humanising creativity to (post humanising) creativity. In A. Harris, P. Thompson, & K. Snepvangers (Eds.), *Creativity, policy, partnership and practice in education*. London, England: Palgrave Macmillan. [https://doi.org/10.1007/978-3-319-96725-7\\_13](https://doi.org/10.1007/978-3-319-96725-7_13)
- Chappell, K., Hetherington, L., Ruck-Keene, H., Wren, H., Alexopoulos, A., Ben-Horin, O., ... Sotoriou, S. (2019). Dialogue and materiality/embodiment in science/arts creative pedagogy: Their role and manifestation. *Thinking Skills and Creativity*, 31, 296–322. <https://doi.org/10.1016/j.tsc.2018.12.008>
- Chen, W. (2015). *Chinese environmental aesthetics* (F. Su, Trans.). London, England: Routledge.
- Cheng, L. (2013). On the four keystones of ecological aesthetic appreciation. In *East Asian criticisms – A critical reader*, 221–236. Estok, S. & Kim, W-C. (Eds.). London, New York: Palgrave Macmillan.
- Chernilo, D. (2016). The question of the human in the Anthropocene debate. *European Journal of Social Theory*, 20(1), 44–60. <https://doi.org/10.1177/1368431016651874>
- Chester, M. (2002). Is symmetry identity? *International Studies in the Philosophy of Science*, 16(2), 111–124. <https://doi.org/10.1080/02698590220145061>

- Chisholm, L. & Demetriou, A. (2006). *Learning to learn: towards complementary perspectives*. Ipsra: Unpublished working paper.
- Claxton, G. (2008). *What's the point of school – Rediscovering the heart of education*. Oxford, England: Oneworld.
- Clegg, S. (2010). Time future – the dominant discourse of higher education. *Time & Society*, 19(3), 345–364. <https://doi.org/10.1177/0961463X10381528>
- Cloudsley-Thompson, J. L. (1961). *Rhythmic activity in animal physiology and behaviour*. New York, London: Academic Press.
- Cohen, L., Manion, L., & Morrison, K. (2011). *Research methods in education* (7<sup>th</sup> ed.). London, England: Routledge.
- Colebrook, C. (2002). *Gilles Deleuze*. London, New York: Routledge. <https://doi.org/10.4324/9780203241783>
- Collingwood, R. G. (1960). *The idea of nature*. Oxford, England: Oxford University Press.
- Connolly, W. (2011). *A world of becoming*. Durham, NC: Duke University Press.
- Connolly, W. (2013). *The fragility of things – self organizing processes, neoliberal fantasies and democratic activism*. Durham, NC: Duke University Press. <https://doi.org/10.1215/9780822377160>
- Conroy, J. C. (2004). *Betwixt and between: The liminal imagination, education and democracy*. New York, NY: Peter Lang.
- Constantino, T., & White, B. (Eds.). (2010). *Essays on aesthetic education for the 21st century*. Rotterdam, Netherlands: Sense.
- Coole, D., & Frost, S. (2010). *New materialisms: ontology, agency and politics*. Durham, NC: Duke University Press. <https://doi.org/10.1215/9780822392996>
- Craft, A. (2005). *Creativity in schools – Tensions and dilemmas*. Abingdon, England: Routledge. <https://doi.org/10.4324/9780203357965>
- Craft, A. (2015). Possibility thinking: From what is to what might be. In S. Robson (Ed.), *Flannery Quinn, S., The Routledge international handbook of young children's thinking and understanding* (pp. 416–432). London, England: Routledge.
- Craft, A. & Chappell, K. (2016). Possibility thinking and social change in primary schools. *Education 3–13*, 44(4), 407–425. <https://doi.org/10.1080/03004279.2014.961947>
- Craft, A., Gardner, H., & Claxton, G. (Eds.). (2008). *Creativity, wisdom and trusteeship – exploring the role of education*. Thousand Oaks, CA: Corwin.
- Craft, A., Jeffrey, B., & Liebling, M. (2007). *Creativity in education*. London, New York: Continuum.

Cremin, T., Glauert, E., Craft, A., Compton, A. & Styliandou, F. (2015). Creative little scientists: Exploring pedagogical synergies between inquiry-based and creative approaches in early years science. *Education 3–13*, 43(4), 404–416.

Csikszentmihalyi, M., & Hermanson, K. (1995). Intrinsic motivation in museums: why does one want to learn? In G. Falk & L. Dierking (Eds.), *Public institutions of personal learning: Establishing a research agenda* (pp. 67–78). American Association of Museums, Technical Information Service.

Cullen, J. (2018). An inside that lies deeper than any internal world - On the ecosophical significance of affect. In P. MacCormack & C. Gardner (Eds.), *Ecosophical aesthetics: Art, ethics and ecology*. London, England: Bloomsbury.

Custerdero, L. (2002). Seeking challenge, finding skills: Flow experience and music education. *Arts Education Policy Review*, 103(3), 3–9.

Danto, A. (1981). *The transfiguration of the commonplace*. Cambridge, MA: Harvard University Press.

Danto, A. (2003). *The abuse of beauty: Aesthetics and the concept of art*. Peru, iii: Open Court.

Davies, P. (1995). *Superforce – The search for a grand unified theory of nature*. London, New York: Penguin Books.

Davies, P. (1999). What is evidence based practice? *British Journal of Educational Studies*, 47(2), 108–121. <https://doi.org/10.1111/1467-8527.00106>  
[PMID:10085963](https://pubmed.ncbi.nlm.nih.gov/10085963/)

Davis, B., & Sumara, D. J. (2006). *Complexity and education: Inquiries into learning, teaching and research*. New York, NY: Routledge.

Davis, H., & Turpin, E. (2015). *Art in the Anthropocene – Encounters among aesthetics, politics, environments and epistemologies*. London, England: Open Humanities Press. [https://doi.org/10.26530/OAPEN\\_560010](https://doi.org/10.26530/OAPEN_560010)

Dawkins, R. (1999). *Unweaving the rainbow*. London, England: Penguin.

DeLanda, M. (2006). *A new philosophy of society – Assemblage theory and social complexity*. London, England: Continuum.

De Landa, M. (2014). *A thousand years of non-linear history*. New York, NY: Swerve.

DeLanda, M. (2016). *Assemblage theory*. Edinburgh, Scotland: Edinburgh University Press.

Deleuze, G. (1988). *Foucault* (S. Hand, Trans.). Minneapolis, MN: University of Minnesota Press.

Deleuze, G. (1995). *Negotiations 1972-1990* (M. Joughin, Trans.). New York, NY: Columbia University Press.

Deleuze, G. (1997). *Essays critical and clinical* (D. W. Smith & M. Greco, Trans.). Minneapolis, MN: University of Minnesota Press.

- Deleuze, G., & Guattari, F. (1994). *What is philosophy?* London, New York: Verso.
- Deleuze, G., & Guattari, F. (2013). *A thousand plateaus*. London, England: Bloomsbury Academic.
- Deleuze, G., & Parnet, C. (2002). *Dialogues II*. New York, NY: Columbia University Press.
- Delius, J. D. (1991). The nature of culture. In M. S. Dawkins, T. R. Halliday, & R. Dawkins (Eds.), *The Tinbergen Legacy* (pp. 75–99). London, England: Chapman & Hall.
- Demos, T. J. (2016). *Decolonizing nature – Contemporary art and the politics of ecology*. Berlin, Germany: Sterberg.
- Denzin, N. K. (2014). *Interpretive autoethnography*. Thousand Oaks, CA: Sage.
- Denzin, N. K. (2016). Interpretive autoethnography. In *Handbook of Autoethnography* Eds Stacy Holman Jones, Tony Adams & Carolyn Ellis. Abingdon, Oxon: Routledge.
- Department for Education (England) (1988). *Education reform act*. London, England: HM Stationery Office.
- Department for Education (England) (1998). *The school standards and framework act*. Nottingham, England: DfES Publications.
- Department for Education (England) (2001) *Schools achieving success*. Nottingham, England: DfES Publications.
- Department for Education (England) (2018). *Principles for a clear and simple accountability system*. London, England: The Stationery Office.
- Department for Education, Northern Ireland (2010). *Every school a good school – School development planning*. [www.deni.gov.uk](http://www.deni.gov.uk).
- Department for Innovation, Universities and Skills (2009). *The learning revolution*. London, England: The Stationery Office.
- Descola, P. (2013). *The ecology of others* (G. Godbout & B. Luley, Trans.). Chicago: Prickly Paradigm Press.
- Descola, P. (2014). *Beyond nature and culture* (B. J. Lloyd, Trans.). Chicago, London: University of Chicago Press.
- Devlin, J. (2017). 'Audience members heart beats beat together at the theatre. Unpublished. <https://www.ucl.ac.uk/pals/news/2017/nov/audience-members-hearts-beat-together-theatre>
- Dewey, J. (1896). The reflex arc concept in psychology. *Psychological Review*, 3(4), 357–370. <https://doi.org/10.1037/h0070405>
- Dewey, J. (1925). *Experience and nature*. Chicago, IL: Open Court.

- Dewey, J. (2005). *Art as experience*. New York, NY: Berkeley Publishing Group. (Original work published 1934)
- Dewey, J. (1963). *Experience and education*. London, England: Collier Macmillan.
- Dewey, J. (1966). *Democracy and education*. London, England: Collier Macmillan. (Original work published 1916)
- Dickie, G. (1996). *The century of taste*. Oxford, England: Oxford University Press.
- Dolphijn, R., & Tuin, I. (2012). *New materialism: Interviews and cartographies*. Ann Arbor, Michigan: Open Humanities Press.  
<https://doi.org/10.3998/ohp.11515701.0001.001>
- Drenthen, M., & Keulartz, J. (Eds.). (2014). *Environmental aesthetics – Crossing divides and breaking ground*. New York, NY: Fordham University Press. <https://doi.org/10.5422/fordham/9780823254491.001.0001>
- Dufrenne, M. (1973). *The phenomenology of aesthetic experience*. Evanston, IL: Northwestern University Press.
- Duke, D. L. (1986). The aesthetics of leadership. *Educational Administration Quarterly*, 22(1), 7–27. <https://doi.org/10.1177/0013161X86022001003>
- Duncan, C. (1995). *Civilizing rituals: Inside public art museums*. London, New York: Routledge.
- Duncum, P. (2004) An eye does not make an I: Expanding the sensorium. *Studies in Art Education*. 53(3), 182–193.
- Eagleton, T. (1990). *The ideology of the aesthetic*. Oxford, England: Blackwell.
- Eagleton, T. (2016). *Culture*. New Haven, London: Yale University Press.
- Edwards, C., Gandini, L., & Forman, G. (Eds.). (1998). *The hundred languages of children – The Reggio Emilia approach – advanced reflections*. Westport, CT: Ablex.
- Edwards, R., & Usher, R. (2001). Lifelong learning: A postmodern condition of education? *Adult Education Quarterly*, 51(4), 273–287.  
<https://doi.org/10.1177/07417130122087296>
- Eisner, E. W. (2002). *The arts and the creation of mind*. New Haven, London: Yale University Press.
- Ekman, P. (1992). An argument for basic emotions. *Cognition and Emotion*, 6(3-4), 169–200. <https://doi.org/10.1080/02699939208411068>
- Ekman, P., & Davidson, R. J. (1993). Voluntary smiling changes regional brain activity. *Psychological Science*, 4(5), 342–345. <https://doi.org/10.1111/j.1467-9280.1993.tb00576.x>
- Ellen, R., & Fukui, K. (Eds.). (1996). *Redefining nature – Ecology, culture and domestication*. Oxford, England: Berg.



- Ellenzweig, S., & Zammito, J. H. (Eds.). (2017). *The new politics of materialism – History, philosophy, science*. London, England: Routledge.  
<https://doi.org/10.4324/9781315268477>
- Elliot, D. (1995). *Music matters: A new philosophy of music education*. New York, NY: Oxford University Press.
- Ellis, C. (2009). *Revision: Autoethnographic reflections on life and work*. Walnut Creek, CA: Left Coast Press.
- Ellis, E. C. (2018). *Anthropocene – A very short introduction*. Oxford, England: Oxford University Press.  
<https://doi.org/10.1093/actrade/9780198792987.001.0001>
- Ellis, L. (2002). The backlash to access. *Engage*, 11, 40–42.
- Elton, C. (1927). *Animal ecology*. London, England: Sidgwick & Jackson.
- Engeström, R. (1995). Voice as communicative action. *Mind, Culture, and Activity*, 2, 192–214.
- Eraut, M. (2000). Non-formal learning, implicit learning and tacit knowledge in professional work. In F. Coffield (Ed.), *The necessity of informal learning*. Bristol, England: The Policy Press.
- Eshach, H. (2007). Bridging in-school and out-of-school Learning: Formal, non-formal, and informal education. *Journal of Science Education and Technology*, 16(2), 171–190. <https://doi.org/10.1007/s10956-006-9027-1>
- Evans, N. (2003). *Making sense of lifelong learning: respecting the needs of all*. London, New York: Routledge Falmer. <https://doi.org/10.4324/9780203464717>
- Evidence Based Teachers Network (2017). The one stop place to find out what works in education. Retrieved from [www.ebtl.org.uk](http://www.ebtl.org.uk)
- Facer, K. (2011). *Learning futures – Education, technology and social change*. Abingdon, Oxon: Routledge. <https://doi.org/10.4324/9780203817308>
- Faure, E., Herrera, F., Kaddoura, A. R., Lopes, H., Pertovsky, A.V., Rahnama, M., Ward, F. C. (1972). *Learning to be: The world of education today and tomorrow*. Paris, France: Harrap, UNESCO.
- Fels, L., & Meyer, K. (1997). On the edge of chaos: Co-evolving world(s) of drama and science. *Teaching Education*, 9(1), 75–81.  
<https://doi.org/10.1080/1047621970090113>
- Felton, M. K., & Kuhn, D. (2007). How do I know? The epistemological roots of critical thinking. *Journal of Museum Education*, 32(2), 101–110.  
<https://doi.org/10.1080/10598650.2007.11510562>
- Fenwick, T. J. (2000). Expanding conceptions of experiential learning: A review of the five contemporary perspectives on cognition. *Adult Education Quarterly*, 50(4), 243. <https://doi.org/10.1177/07417130022087035>
- Ferry, L. (1993). *Homo aestheticus: The invention of taste in the modern age* (R. Loaiza, Trans.). Chicago, IL: University of Chicago Press.

- Field, J. (2000). *Lifelong learning and the new educational order*. Stoke on Trent, England: Trentham.
- Field, J., & Leicester, M. (2003). *Lifelong learning: education across the life span*. London, England: Routledge Falmer.
- Fink, A. (1988). *Conducting literature research reviews: from paper to the Internet*. Thousand Oaks, CA: Sage.
- Fleischacker, S. (2013). *What is enlightenment?* Abingdon, Oxfordshire: Routledge. <https://doi.org/10.4324/9780203070468>
- Flude, R., & Parrott, A. (1979). *Education and the challenge of change – A recurrent education strategy for Britain*. Milton Keynes, England: Open University Press.
- Foreman-Peck, L., & Travers, K. (2013). What is distinctive about museum pedagogy and how can museums best support learning in schools? An action research inquiry into the practice of three regional museums. *Educational Action Research*, 21(1), 28–41. <https://doi.org/10.1080/09650792.2013.761924>
- Foucault, M. (1985). The history of sexuality: Vol. 2. *The Use of Pleasure*. New York, NY: Vintage Books.
- Fox, J. N. (2003). Practice-based evidence: Towards collaborative and transgressive research. *Sociology*, 37(1), 81–102. <https://doi.org/10.1177/0038038503037001388>
- Fox, N., & Alldred, P. (2017). *Sociology and the new materialism: Theory, research, action*. Thousand Oaks, CA: Sage Publishing. <https://doi.org/10.4135/9781526401915>
- Franzini, C., Romanelli, G., & Vatin, P. (2011). *The Fortuny museum in Palazzo Pesaro degli Orfei, Venice. Fondazione Musei Civici Venezia*. Geneva, Switzerland: Skira. [Eds].
- Freire, P. (1968). *Pedagogy of the oppressed*. New York, NY: Routledge.
- Freire, P. (1985). *The politics of education: Culture, power and liberation*. Westport, Connecticut: Bergin and Garvey. <https://doi.org/10.1007/978-1-349-17771-4>
- Freire, P. (2004). *Pedagogy of hope*. London, England: Continuum.
- Fullan, M. (2001). *Leading in a culture of change*. San Francisco, CA: Jossey Bass Wiley.
- Furedi, F. (2004). *Where have all the intellectuals gone? Confronting twentieth century philistinism*. London, New York: Continuum.
- Furstenberg and Plegge. (2009). Gallery education by agreement, or establishing “hazardous bodies”. In C. Morsch (Ed.), *Documenta 12 education (2)- Between critical practice and visitor services*. Zurich, Switzerland: IAE.
- Gardner, L. (2014). Matt Fraser’s museum piece challenges us all to bring disability out of the box. *The Guardian*, 3<sup>rd</sup> March 2014.

- Garforth, F. W. (Ed.). (1966). *John Dewey selected educational writings*. London, England: Heinemann.
- Garratt, B. (2000). *The learning organization: Developing democracy at work*. New York, NY: Harper Collins.
- Gaut, B. (1997). Metaphor and the understanding of art. *Proceedings of the Aristotelian Society*, 97(3), 223–241. <https://doi.org/10.1111/1467-9264.00014>
- Genoways, H. H. (Ed.). (2006). *Museum philosophy for the twenty-first century*. Lanham, MD: Rowman & Littlefield.
- Giblett, R. (2008). *The body of nature and culture*. London, England: Palgrave Macmillan. <https://doi.org/10.1057/9780230595170>
- Gibson, J. (1966). *The sense considered as perceptual systems*. London, England: Allen and Unwin.
- Gibson, J. (1979). *The ecological approach to visual perception*. Boston, MA: Houghton Mifflin Harcourt.
- Gilbert, S. F., Sapp, J., & Tauber, A. I. (2012). A symbiotic view of life: We have never been individuals. *The Quarterly Review of Biology*, 87(4), 325–341. <https://doi.org/10.1086/668166> PMID:23397797
- Goldman, A. (2006). The experiential account of aesthetic value. *The Journal of Aesthetics and Art Criticism*, 64(3), 333–342. <https://doi.org/10.1111/j.1540-594X.2006.00211.x>
- Gordon, J. I. (2012). Honor thy gut symbionts redux. *Science*, 336(6086), 1251–1253. <https://doi.org/10.1126/science.1224686> PMID:22674326
- Gore, A. (1992). *Earth in the balance: Ecology and the human spirit*. Boston, MA: Houghton Mifflin.
- Gould, S. J. (1997). Kropotkin was no crackpot. *Natural History*, 106, 12–21.
- Grant, J. (2013). *The critical imagination*. Oxford, England: Oxford University Press. <https://doi.org/10.1093/acprof:oso/9780199661794.001.0001>
- Grayson, H. (2019). *School accountability in England: A critique*. Headteacher Update, NFER Research Update. ([www.headteacher-update.com/best-practice-article/school-accountability-in-england-a-critique/200743](http://www.headteacher-update.com/best-practice-article/school-accountability-in-england-a-critique/200743)).
- Green, K., Trundle, K. & Shaheen, M. (2018). Integrating the arts into science teaching and learning: A literature review. *Journal of Learning Through the Arts*, 14(1), 1–26. <https://doi.org/10.21977/D914140829>
- Green, L. (2008). *Music, informal learning and the school: A new classroom pedagogy*. Burlington, VT : Ashgate.
- Greene, B. (2000). *The elegant universe*. London, England: Vintage.
- Grayson, H. (2019). School accountability in England: A critique. *Headteacher Insights: National Foundation for Educational Research*.



<http://www.headteacher-update.com/best-practice-article/school-accountability-in-england-a-critique/200743/>

Gregg, M., & Seigworth, G. J. (Eds.). (2010). *The affect theory reader*. Durham, NC: Duke University Press.

Grosz, E. (2004). *The nick of time – politics, evolution, and the untimely*. Durham, London: Duke University Press.  
<https://doi.org/10.1215/9780822386032>

Gualdoni, F. (2008). *Mariano Fortuny*, Milan, It: Skira.

Guattari, F. (1995). *Chaosmosis: An ethico-aesthetic paradigm*. Bloomington, IN: Indiana University Press.

Guattari, F. (2014). *The Three Ecologies*. London, England: Bloomsbury.

Gurnon, D, Voss-Andreae, J. & Stanley, J. (2013). Integrating art and science in undergraduate education. *PLoS*.  
[Bio/https://doi.org/10.1371/journal.pbio.1001491](https://doi.org/10.1371/journal.pbio.1001491).

Guyer, P. (2013). History of modern aesthetics. In J. Levinson (Ed.), *The Oxford Handbook of Aesthetics*. Oxford, England: Oxford University Press.

Habermas, J. (1972). *Knowledge and Human Interests* (J. Shapiro, Trans.). London, England: Heinemann.

Haeckel, E. (1866). *Generelle Morphologie der Organismen* (Vols. 1–2). Berlin, Germany: Georg Reimer. <https://doi.org/10.1515/9783110848281>

Hammersley, M. (Ed.). (2007a). *Educational research and evidence based practice*. London, UK: Sage.

Hale, J., Thompson, J. M., Morgan, H. M., Cappalletti, M. & Kadosh, R. (2014). Better together? The cognitive advantages of synaesthesia for time, numbers and space. *Cognitive Neuropsychology*, 31(7-8), 545–564.

Hammersley, M. (2007b). The issue of quality in educational research. *International Journal of Research & Method in Education*, 30(3), 287–305.  
<https://doi.org/10.1080/17437270701614782>

Hanquinet, L., & Savage, M. (2012). Educative leisure and the art museum. *Museum & Society*, 10(1), 42–59.

Haraway, D. (2008). *When species meet*. Minneapolis, MI: University of Minnesota Press.

Haraway, D. (2016). *Staying with the trouble: Making kin in the Chthulucene (experimental futures)*. Durham, NC: Duke University Press.  
<https://doi.org/10.1215/9780822373780>

Harber, C. (2008). Perpetuating disaffection: Schooling as an international problem. *Educational Studies*, 34(5), 457–467.  
<https://doi.org/10.1080/03055690802288445>

Hargreaves, D. (2007). Teaching as a research based profession: possibilities and prospects (The Teacher Training Agency Lecture 1996). In M. Hammersley (Ed.), *Educational research and evidence based practice*. London, England: Sage.

Harman, G. (2018). *Object-oriented ontology – A new theory of everything*. London, England: Pelican Books.

Harrison, R. (2003). Learning for professional development. In Kydd, L., Anderson, L. & Newton, W., *Leading people and teams in education*. London, England: Open University and Paul Chapman.

Hayward Gallery. (2012). *New directions from China*. London: Hayward Gallery Publications.

Hegel, F. (1920). *The Philosophy of Fine Art* (Vol. 1). London, England: G. Bell.

Hegel, G. (1993). *Introductory lectures on aesthetics*. London, England: Penguin.

Hein, G. (1991a). *Learning in the museum*. London, England: Routledge.

Hein, G. (1991b). 'Constructivist learning theory', in *The Museum and the Needs of People*, ICOM/CECA Annual Conference, Jerusalem, Israel.

Hein, H. (2006). Assuming responsibility: Lessons from aesthetics. In H. H. Genoways (Ed.), *Museum Philosophy for the Twenty-first Century*. Oxford, England: AltaMira.

Hendrix, R., Eick, C., & Shannon, D. (2012). The integration of creative drama in an inquiry-based elementary program: The effect on student attitude and conceptual learning. *Journal of Science Teacher Education*, 23(7), 823–846. <https://doi.org/10.1007/s10972-012-9292-1>

Hiemstra, R. (1981). The implications of lifelong learning. In Z. Collins (Ed.), *Museums, adults and the humanities*. Washington, DC: American Association of Museums.

Higgins, S. & Coffield, F. (Eds.). (2016). *John Dewey's democracy and education – A British tribute*. London, England: UCL Institute of Education Press.

Honderick, T. (Ed.). (2005). *The Oxford Companion to Philosophy (New Edition)*. Oxford, England: Oxford University Press.

Hood, E. J. & Kraehe, A. M. (2017). Creative matter: New materialism in art education research, teaching and learning. *Art Education*, 70(2), 32–38.

Hooper-Greenhill, E. (1994). *Museums and their visitors*. London, England: Routledge.

Hooper-Greenhill, E. (Ed.). (1999). *The educational role of the museum*. Abingdon, Oxon: Routledge.

Hooper-Greenhill, E., & Moussouri, T. (2001). *Researching learning in museums and galleries 1990-1999: A bibliographic review*. Leicester: Research Centre for Museums and Galleries. University of Leicester.

Horvath, A., Thomassen, B. & Wydra, H. (2018) (Eds.). *Breaking Boundaries – Varieties of Liminality*. New York: Bergahn Books.

Hultman, K. & Lenz Taguchi, H. (2010) Challenging anthropocentric analysis of visual data: a relational materialist methodological approach to educational research. *International Journal of Qualitative Studies in Education*. 23(5), 525-542. DOI: 10.1080/09518398.2010.500628.

Humphrey, N., & Symes, W. (2011). Inclusive education for pupils with autistic spectrum disorders in secondary mainstream schools: Teacher attitudes, experience and knowledge. *International Journal of Inclusive Education*, 1, 1–29. <https://doi.org/10.1080/13603116.2011.580462>

Hutchings, M. (2015). *Exam factories? The impact of accountability measures on children and young people*. London, England: National Union of Teachers.

Illeris, H. (2006). Museums and galleries as performative sites for lifelong learning: Constructions, deconstructions and reconstructions of audience position in museum and gallery education. *Museum & Society*, 4(1), 15–26.

Illeris, K. (2009) (Ed.). *Contemporary theories of learning: Learning theorists in their own words*. London & New York: Routledge.

Illeris, K. (2014). *Transformative learning and identity*. London & New York: Routledge.

Ingold, T. (1996). Hunting and gathering as ways of perceiving the environment. In R. Ellen & K. Fukui (Eds.), *Redefining nature: Ecology, culture and domestication*. Oxford, England: Berg.

Ingold, T. (2018). Back to the future with the theory of affordances. *HAU*, 8(1/2), 39–44. <https://doi.org/10.1086/698358>

Ivinson, G. & Renold, E. (2016). Girls, camera, (intra)action: Mapping posthuman possibilities in a diffractive analysis of camera-girl assemblages in research on gender, corporeality and place. In C. Taylor & C. Hughes (Eds.), *Posthuman research practices in education*. Buckingham, England: Palgrave.

Jarvis, P. (2004). *From adult education to lifelong learning: a conceptual framework*. *Adult Education and Lifelong Learning: theory and practice*. London, England: Routledge Falmer. <https://doi.org/10.4324/9780203561560>

Jeffrey, B., & Craft, A. (2004). Teaching creatively and teaching for creativity: Distinctions and relationships. *Educational Studies*, 30(1), 77–87. <https://doi.org/10.1080/0305569032000159750>

Jirousek, C. (1995). 'Art, design and visual thinking'. Extracted from webpage: <http://char.txa.cornell.edu/language/principi/rhythm/rhythm.htm>

Jonas, H. (1966). *The phenomenon of life: Towards a philosophical biology*. New York, NY: Harper Row.

- Jordan, R. & Powell, S. (1995). *Understanding and teaching children with autism*. Chichester, England: John Wiley.
- Juniper, T. (2003). *What has nature ever done for us?: How money really does grow on trees*. London, England: Profile.
- Kai-Kee, E. (2015). *On visiting an art museum*. Paper presented at the D. Jack Davis Annual Lecture in Art Education, Denton, TX: University of North Texas.
- Kant, I. (2004). *Critique of practical reason*. New York, NY: Dover. (Original work published 1788)
- Kant, I. (2007). *Critique of judgement*. Oxford, England: Oxford University Press. (Original work published 1790)
- Kant, I. (2011). *The critique of pure reason* (J. M. D. Meiklejohn, Trans.). Seattle, WA: Pacific Publishing Studio. (Original work published 1781)
- Katz-Buonincontro, J. (2011): How might aesthetic knowing relate to leadership? A review of the literature. *International Journal of Education and the Arts*, 12, 1.3.
- Keats, J. (1819). 'Ode on a Grecian Urn', No. 625 in Quiller-Couch, A. (1819) [ed.] *The Oxford book of English verse: 1250–1900*. Oxford, England: Oxford University Press.
- Kegan, R. (2009). What form transforms? A constructivist-developmental approach to transformative learning. In K. Illeris (Ed.), *Contemporary theories of learning*. London, England: Routledge.
- Kelehear, Z. (2008). Instructional leadership, connoisseurship and critique: Using an arts based approach to extend conversations about teaching. *International Journal of Leadership in Education*, 11(3), 239–256.  
<https://doi.org/10.1080/13603120701721821>
- Keller, K. (1983). The puritan perverse. *Texas Studies in Literature and Language*, 25(1), 139–164.
- Kemal, S., & Gaskell, I. (Eds.). (1995). *Landscape, natural beauty and the arts*. New York, NY: Cambridge University Press.
- Kendall, G. (2014) Deep Impact, in: *Museums Journal*, March 2014, 26, London, England: Museums Association.
- Klein, J. T. (2015). Reprint of “discourses of transdisciplinarity: Looking back to the future.” *Futures*, 63, 61–65.
- Knowles, M. S. (1981). The future of lifelong learning. In Z. Collins (Ed.), *Museums, Adults and the Humanities* (pp. 131–143). Washington, DC: AAM.
- Kolb, D. (1984). *Experiential Learning: experience as a source of learning and development*. Englewood Cliffs: Prentice Hall.
- Kolodziejczyk, J. & Trzopek-Paszkiewicz (2016). The competency of creating a vision and concept of the school and the competency of effective communication of a vision and concept of the school: Research reports. In T.

- Hurley & E. O'Connor (Eds.), *Leadership for future focused education and learning for all* (pp. 90-106). Dublin: Drumcondra Education Centre.
- Koren, L. (2008). *Wabi-Sabi for artists, designers, poets and philosophers*. Point Reyes, CA: Imperfect.
- Kovacs, Z., LeRoy, C., Fischer, D., Lubarsky, S., & Burke, W. (2006). How do aesthetics affect our ecology? *Aesthetics and Ecology*, 10, 61–65.
- Krishnamurti, J. (1975). *Beginnings of learning*. London, England: Arkana.
- Kurokawa, K. (1991). *Intercultural architecture – The philosophy of symbiosis*. London, England: Academy Editions.
- Land, G. & Jarman, B. (1992). *Break-point and beyond: Mastering the future – today*. New York, NY: Harper Collins.
- Langer, S. (1953). *Feeling and form*. New York, NY: Scribner's.
- La Shure, C (2005). What is liminality?  
<http://www.liminality.org/about/whatisliminality/>
- Lather, P. & St. Pierre, E. (2013) Introduction: Post qualitative research. *International Journal of Qualitative Studies in Education*, 26(6): 629–633.
- Latimer, J. & Miele, M. (2013). Naturecultures: Science, affect and the non-human. *Theory, Culture and Society*, 30(7/8), 5–31.
- Latour, B. (2005). *Reassembling the social: An Introduction to actor network theory*. Oxford, England: Oxford University Press.
- Latour, B. (2018). *Down to earth – Politics in the new climatic regime*. Cambridge, England: Polity.
- Lave, J., & Wenger, E. (1991). *Situated learning*. Cambridge: Cambridge University Press. <https://doi.org/10.1017/CBO9780511815355>
- Leder, H., Tinio, P., Brieber, D., Kroner, T. Jacobsen, T. & Rosenberg, R. (2018). Symmetry is not a universal law of beauty. *Empirical Studies of the Arts*, 1-11. <https://doi.org/10.1177/0276237418777941>
- Lefebvre, H. (2013). *Rhythmanalysis – Space, time and everyday life*. London, England: Bloomsbury.
- LeGrange, L. (2018). What is post (qualitative) research? *South African Journal of Higher Education*, 32(5), 1–14.
- Lennon, S. ((2017) Re-turning feelings that matter using reflexivity and diffraction to think with and through a moment of rupture in activist work. *International Journal of Qualitative Studies in Education*. 30(6), 535–545.
- Le Roux, C. S. (2017). Exploring rigour in autoethnographic research. *International Journal of Social Research Methodology*, 20(2), 195–207.  
<https://doi.org/10.1080/13645579.2016.1140965>
- Levinas, E. (1985). *Ethics and infinity*. Pittsburgh, PA: Duquesne University Press.



Levinson, J. (Ed.). (2013). *The Oxford handbook of aesthetics*. Oxford, England: Oxford University Press.

Lewis, G. (2015). Motivational classroom climate for learning of mathematics: A reversal theory of perspective. *For the Learning of Mathematics*, 35(3), 29–34.

Lewis, S. L., & Maslin, M. A. (2018). *The human planet – How we created the Anthropocene*. London, England: Penguin.

Lewis, T. E. (2014). *The aesthetics of education – Theatre, curiosity, and politics in the work of Jacques Ranciere and Paulo Freire*. New York, London: Bloomsbury Academic.

Lindgaard, G., Fernandes, G. J., Dudek, C., & Brown, J. (2006). Attention web designers: You have 50 Milliseconds to make a good first Impression! *Behaviour & Information Technology*, 25(2), 115–126.  
<https://doi.org/10.1080/01449290500330448>

Lindsay, S., Proulx, M., Scott, H., & Thomson, N. (2014). Exploring teachers' strategies for including children with autism spectrum disorder in mainstream classrooms. *International Journal of Inclusive Education*, 18(2), 101–122.  
<https://doi.org/10.1080/13603116.2012.758320>

Loewenstein, G. (1994). The psychology of curiosity: A review and reinterpretation. *Psychological Bulletin*, 116(1), 75–98.  
<https://doi.org/10.1037/0033-2909.116.1.75>

Loi, D., & Dillon, P. (2006). Adaptive educational environments as creative spaces. *Cambridge Journal of Education*, 36(3), 363–381.  
<https://doi.org/10.1080/03057640600865959>

Longworth, N. (2003). *Lifelong learning in action: Transforming education in the 21st century*. London, Sterling, VA: Kogan Page.

Louv, R. (2009). *Last child in the woods – Saving our children from nature-deficit disorder*. London, England: Atlantic.

Louv, R. (2012). *The nature principle – Reconnecting with life in a virtual age*. Chapel Hill, NC: Algonquin Books.

Lovelock, J. (2000). *Gaia – A new look at life on earth*. Oxford, England: Oxford University Press.

Lykke, N. (2018). Postdisciplinarity. In: Braidotti, R. and Hlavajova, M. (Eds.) *Posthuman Glossary*. London, England: Bloomsbury Academic.

Lyon, D. (2019). *What is rhythmanalysis*. London, England: Bloomsbury Academic.

MacCormack, P., & Gardner, C. (Eds.). (2018). *Ecosophical aesthetics – Arts, ethics and ecology with Guattari*. London, England: Bloomsbury Academic.

MacRae, C., Hackett, A., Holmes, R., & Jones, L. (2018). Vibrancy repetition and movement: Posthuman theories for reconceptualising young children in museums. *Children's Geographies*, 16(5), 503–515.  
<https://doi.org/10.1080/14733285.2017.1409884>

- Manning, E., & Massumi, B. (2014). *Thought in the act – Passages in the Ecology of Experience*. Minneapolis, MN: University of Minnesota Press.
- Marak, Q. (2015). Writing the 'self': Introducing autoethnography. *Man in India*, 95(1), 1–10.
- Margulis, L. (1981). *Symbiosis in cell evolution*. New York, NY: W.H. Freeman.
- Margulis, L. (1988). *Symbiotic planet (A new look at evolution)*. New York, NY: Basic Books.
- Margulis, L., & Sagan, D. (2001). The beast with five genomes. *Natural History*, 111, 38–41.
- Marković, S. (2012). Components of aesthetic experience: Aesthetic fascination, aesthetic appraisal, and aesthetic emotion. *Iperception*, 3(1), 1–17. <https://doi.org/10.1068/i0450aap> PMID:23145263
- Marland, M., & Rogers, R. (2002). *Managing the arts in the curriculum*. Oxford, England: Heinemann Educational.
- Marshall, J. (2014). Transdisciplinarity and art integration – Toward a new understanding of art-based learning across the curriculum. *Studies in Art Education*, 55(2), 104–127. <https://doi.org/10.1080/00393541.2014.11518922>
- Martin, I. (2006). Where have all the flowers gone? *Adult Learning*, 18(2), 15–18.
- Martinique, A. P. (2005). *Philosophical writing – An introduction* (3rd ed.). Malden, MA: Blackwell Publishing.
- Maslow, A. (1993). *The farther reaches of human nature*. London, England: Arkana.
- Masny, D. (Ed.). (2013). *Cartographies of becoming in education – A Deleuze-Guattari perspective*. Rotterdam, Netherlands: Sense. <https://doi.org/10.1007/978-94-6209-170-2>
- Massumi, B. (2002). *Parables for the virtual: Movement, affect, sensation*. Durham, NC: Duke University Press.
- Massumi, B. (2013). *Semblance and event – Activist philosophy and the occurrent arts*. Cambridge, MA: MIT Press.
- Massumi, B. (2014). *What animals teach us about politics*. Durham, London, England: Duke University.
- Massumi, B. (2015). *The politics of affect*. Cambridge, MA: Polity Press.
- McCrae, R. (2007). Aesthetic chills as a universal marker of openness to experience. *Motivation and Emotion*, 31(1), 5–11. <https://doi.org/10.1007/s11031-007-9053-1>
- McDaniel, M. A. & Einstein, G. O. (1986). Bizarre imagery as an effective memory aid: The importance of distinctiveness. *Journal of Experimental Psychology: Learning, Memory and Cognition*. 12(1), 54-65.

- McGilchrist, I. (2012). *The master and his emissary – The divided brain and the making of the Western world*. New Haven, CT: Yale University Press.
- McInerney, P., Smyth, J. & Dawn, B. (2011). Coming to a place near you: The politics and possibilities of a critical pedagogy of place-based education. *Asia-Pacific Journal of Teacher Education*, 39(1), 3–16.
- McKibben, W. (2010). *Eaarth – Making a life on a tough new planet*. New York, NY: Times Books.
- McManus, I. C. (2005). Symmetry and asymmetry in aesthetics and the arts. *European Review*, 13(52), 157–180.
- McPherson, G. (2006). Public memories and private tastes: The shifting definitions of museums and their visitors in the UK. *Museum Management and Curatorship*, 21(1), 44–57. <https://doi.org/10.1080/09647770600602101>
- McRae, R. R. (2007). Aesthetic chills as a universal marker to experience. *Motivation and Emotion*, 31(1), 5–11. <https://doi.org/10.1007/s11031-007-9053-1>
- Mead, G. H. (1936). Science raises problems for philosophy – Vitalism; Henri Bergson. In M. H. Moore (Ed.), *Movements of Thought in the Nineteenth Century*. Chicago, IL: Chicago University Press.
- Medel-Anoneuvo, C., Ohsaka, T., & Mauch, W. (2001). *Revisiting lifelong learning for the 21st century*. Hamburg, Germany: UNESCO Institute of Education.
- Merleau-Ponty, M. (1962). *The phenomenology of perception* (C. Smith, Trans.). London, New York: Routledge and Kegan Paul.
- Merleau-Ponty, M. (1964). *Sense and non-sense* (H. Dreyfus & P. Dreyfus, Trans.). Evanston, Illinois: Northwestern University Press.
- Mertens, D. M. (2007). Transformative paradigm: Mixed methods and social justice. *Journal of Mixed Methods Research*, 1(3), 212–225. <https://doi.org/10.1177/1558689807302811>
- Meyer, J. H. F., & Land, R. (2006). *Overcoming barriers to student understanding: Threshold concepts and troublesome knowledge*. London, New York: Routledge. <https://doi.org/10.4324/9780203966273>
- Mezirow, J. (1978). *Education for perspective transformation – Women's re-entry programs in community colleges*. New York, NY: Teachers College, Columbia University.
- Mezirow, J. (1980). Perspective transformation. In S. Reedy & M. Woodhead (Eds.), *Family, Work and Education* (pp. 270–278). Milton Keynes, England: The Open University.
- Mezirow, J. (1996). Contemporary paradigms of learning. *Adult Education Quarterly*, 46(3), 158–172. <https://doi.org/10.1177/074171369604600303>
- Mezirow, J. (2000). *Learning as transformation*. San Francisco, CA: Jossey-Bass.



- Mezirow, J. (2009). An overview of transformative learning. In K. Illeris (Ed.), *Contemporary theories of learning* (pp. 90–105). London, England: Routledge.
- Miles, M. (2014). *Eco-aesthetics: art, literature and architecture in a period of climate change*. London, New York: Bloomsbury.
- Milliband, D. (2004). A new relationship with schools. *Address to the North of England Conference*, Belfast, 8 January 2004.
- Miller, J. (2002). *Devout Sceptics*. London, England: BBC Radio 4.
- Milovanov, K., Nikitina, E., Sokolova, N., & Sergeyeva, M. (2017). The creative potential of museum pedagogy within the modern society. *Espacios Education*, 38(40), 27–32.
- Moore, C. (2004). *George and Sam*. London, England: Penguin.
- Monk, D. F. (2013). John Dewey and adult learning in museums. *Adult Learning*, 24(2), 63–71. <https://doi.org/10.1177/1045159513477842>
- Morsch, C. (Ed.). (2009). *Documenta 12 education – Between critical practice and visitor services*. Zurich, Switzerland: IAE.
- Morton, T. (2009). *Ecology without nature*. Cambridge, MA: Harvard University Press.
- Morton, T. (2012). *The ecological thought*. Cambridge, MA: Harvard University Press.
- Morton, T. (2013). *Hyperobjects*. Minneapolis, MN: University of Minnesota Press.
- Morton, T. (2016). *Dark ecology – For a logic of future co-existence*. New York, NY: Columbia University Press. <https://doi.org/10.7312/mort17752>
- Morton, T. (2017). *Humankind – Solidarity with non-human people*. London, England: Verso.
- Mullarkey, J., & Ansell-Pearson, K. (2014). *Henri Bergson – Key writings*. London: Bloomsbury Academic.
- Muncey, T. (2010). *Creating autoethnographies*. London, England: Sage. <https://doi.org/10.4135/9781446268339>
- Murris, K. (2016). *The post human child: Educational transformation through philosophy with picture books*. London, England: Routledge. <https://doi.org/10.4324/9781315718002>
- Museums Association. (2013). *Museums change lives: The MA's vision for the impact of museums*. London, England: Museums Association.
- Museums Association. (2019). *Museums journal* (pp. 1–66). London, England: Museums Association, January.
- Museums, Libraries and Archive Council. (2008). *Research briefing 6 – Participation in libraries and museums at the local level: Summary findings from active people data*. <http://research.mla.gov.uk>

- Nagel, T. (1974). What is it like to be a bat? *The Philosophical Review*, 83(4), 435–450. <https://doi.org/10.2307/2183914>
- NACC.CE. (1999). *All our futures – Creativity, culture and education*. London, England: DFEE.
- Neil, A. S. (1976). *Summerhill*. Middlesex, England: Penguin.
- Nelson, J., & Campbell, C. (2017). Evidence-informed practice in education: Meanings and applications. *Educational Research*, 59(2), 127–135. <https://doi.org/10.1080/00131881.2017.1314115>
- Nemirovsky, R. (2018). Pedagogies of emergent learning. In: Kaiser, G., Forgasz, H., Graven, M., Kuzniak, A., Simmt, E. & Xu, B. (Eds.). *Invited Lectures for the 13<sup>th</sup> International Congress on Mathematical Education*. ICME-13 Monographs. Cham, Switzerland: Springer.
- Nordén, P. (2018). Transdisciplinary teaching for sustainable development in a whole school project. *Environmental Education Research*, 24(5), 663–677. <https://doi.org/10.1080/13504622.2016.1266302>
- O'Brien, M. & Candlin, F. (2001). Lifelong learning in museums: A critical appraisal. In Jones, D.J. & Normie, G. (Eds.) *2001: A spatial odyssey*. Nottingham, England: Continuing Education Press.
- Office for Standards in Education. (2019). Education inspection framework: Overview of research. [www.gov.uk/government/organisations/ofsted](http://www.gov.uk/government/organisations/ofsted).
- OECD. (1996). *Lifelong learning for all: Meeting of the education committee at ministerial level, 16-17 January 1996*. Paris, France: OECD.
- Onians, J. (2007). *Neuroarthistory: From Aristotle and Pliny to Baxandall and Zeki*. New Haven, London: Yale University Press.
- Oswald, A. (2002). *Dart*. London, England: Faber and Faber.
- Osberg, D. (2008). The logic of emergence: An alternative conceptual space for theorising critical education. *Journal of the Canadian Association for Curriculum Studies*, 6(1), 133–161.
- Osberg, D. (2018). Education and the future. In R. Poli (Ed.), *Handbook of anticipation*. Cham, Switzerland: Springer. [https://doi.org/10.1007/978-3-319-31737-3\\_88-1](https://doi.org/10.1007/978-3-319-31737-3_88-1)
- Osberg, D. & Biesta, G. (2007). Beyond re/presentation: A case for updating the epistemology of schooling. *Interchange*, 38(1), 15–29. <https://doi.org/10.1007/s10780-007-9015-2>
- Osberg, D. & Biesta, G. (2008). The emergent curriculum: Navigating a complex course between unguided learning and planned enculturation. *Journal of Curriculum Studies*, 40(3), 313–328. <https://doi.org/10.1080/00220270701610746>
- Osberg, D., & Biesta, G. (Eds.). (2010). *Complexity theory and the politics of education*. Rotterdam, Netherlands: Sense.

Osberg, D. & Biesta, G. (2018). Beyond the educational machine: Prolegomena for an aesthetic theory of education. Paper presented at the European Conference on Educational Research (ECER). Bozen/Bolzano, Italy, 3–7 September 2018.

Partridge, L. & Bath, N. (2019). *Schools without walls*. London, England: Royal Society for the Encouragement of Arts, Manufactures and Commerce [RSA].

Osberg, D., Biesta, G. & Cilliers, P. (2008). From representation to emergence: Complexity's challenge to the epistemology of schooling. *Education Philosophy and Theory*, 40:1, 213–227. <https://doi.org/10.1111/j.1469-5812.2007.00407.x>

Park, J. Y., & Son, J. B. (2010). Transitioning toward transdisciplinary learning in a multidisciplinary environment. *International Journal of Pedagogies and Learning*, 6(1), 82–93. <https://doi.org/10.5172/ijpl.6.1.82>

Partridge, L. & Bath, N. (2019). *Schools without walls*. London, England: Royal Society for the Encouragement of Arts, Manufactures and Commerce [RSA].

Pirbhai-Illich, F., Pete, S., & Martin, F. (Eds.). (2017). *Culturally responsive pedagogy – Working towards decolonization, indigeneity and interculturalism*. London, England: Palgrave Macmillan. <https://doi.org/10.1007/978-3-319-46328-5>

Poli, R. (2010). The many aspects of anticipation. *Foresight*, 12(3), 7–17. <https://doi.org/10.1108/14636681011049839>

Poli, R. (2017). *Introduction to anticipation studies*. Cham, Switzerland: Springer. <https://doi.org/10.1007/978-3-319-63023-6>

Polkinghorne, D. (1995). Narrative configuration in qualitative analysis. In J. A. Hatch & R. Wisniewski (Eds.), *Life history and narrative*. London, England: Falmer.

Powell, W. W., & Snellman, K. (2004). The knowledge economy. *Annual Review of Sociology*, 30(1), 199–220. <https://doi.org/10.1146/annurev.soc.29.010202.100037>

Pretty, J. & Pilgrim, S. (2008) Nature and culture. *Resurgence Magazine*, 250.

Prigogine, I. & Stengers, I. (1984). *Order out of chaos – Man's new dialogue with nature*. New York, NY: Bantam Books.

Prince, D. R. (1985). The museum as dreamland. *International Journal of Museum Management and Curatorship*, 3, 243–250.

Pring, R. (2014). *John Dewey*. London, England: Bloomsbury Academic.

Radman, A. (2019). Involuntary architecture: Unyoking coherence from congruence. In B. Rosi & S. Bagnall (Eds.), *Posthuman ecologies – Complexity and process after Deleuze*. London, England: Rowman and Littlefield International Ltd.

Ranciere, J. (2004). *The politics of aesthetics – The distribution of the sensible*. London, New York: Continuum.

- Ranciere, J. (2009). *Aesthetics and its Discontents*. Cambridge, England: Polity Press.
- Ranciere, J. (2010). *Dissensus – On politics and aesthetics*. London, England: Bloomsbury.
- Ranciere, J. (2013). *Aisthesis – Scenes from the aesthetic regime of art*. London, New York: Verso.
- Ransome, P. (2011). Qualitative pedagogy versus instrumentalism: The antimonies of higher education learning and teaching in the UK. *Higher Education Quarterly*, 65(2), 206–223. <https://doi.org/10.1111/j.1468-2273.2010.00478.x>
- Rasmussen, J. (2010). Increasing complexity by reducing complexity – A Luhmannian approach to learning. In Osberg, D. & Biesta, G. (Eds.). (2010). *Complexity theory and the politics of education*. Rotterdam, Netherlands: Sense. 15–24.
- Reckwitz, A. (2012). Affective spaces: A praxeological outlook. *Rethinking History*, 16(2), 241–258. <https://doi.org/10.1080/13642529.2012.681193>
- Reeve, S. (2011). *Nine ways of seeing a body*. Devon, England: Triarchy Press.
- Reitter, P., & Wellmon, C. (Eds.). (2016). *Anti-education – Friedrich Nietzsche*. New York, NY: New York Review of Books.
- Rekret, P. (2018). The head, the hand and matter – New materialism and the politics of knowledge. *Theory, Culture & Society*, 35(7-8), 49–72. <https://doi.org/10.1177/0263276418806369>
- Relph, E. (1976). *Place and placelessness*. London, England: Pion.
- Revens, R. W. (1982). *The origins and growth of active learning*. Kent, England: Chartwell-Bratt, Bromley and Lund.
- Reyes-García, V., Guèze, M., Díaz-Reviriego, I., Duda, R., Fernández-Llamazares, Á., Gallois, S., . . . Pyhälä, A. (2016). The adaptive nature of culture. A cross-cultural analysis of the returns of local environmental knowledge in three indigenous societies. *Current Anthropology*, 57(6), 761–784. <https://doi.org/10.1086/689307> PMID:28104924
- Ridley, M. (1997). *The origins of virtue*. Newton Abbot, England: BCA Softback Preview.
- Riley, K., Ellis, S. & Hallmond, S. (2005). Re-engaging disaffected pupils in learning: Insights for policy and practice. Paper presented at *The European conference on educational research*, University College, Dublin, 7–10 September, 2005.
- Ritchhart, R. (2007). Cultivating a culture of thinking in museums. *Journal of Museum Education*, 32(2), 137–153. <https://doi.org/10.1080/10598650.2007.11510565>
- Robinson, K. (1982). *The arts in schools: Principles, practice and provision*. Lisbon, Portugal: Calouste Gulbenkian Foundation.

Roche, J. J. (1987). A critical study of symmetry in physics from Galileo to Newton. In M. G. Doncel, A. Hermann, L. Michel, & A. Pais (Eds.), *Symmetries in physics (1600-1980)* (pp. 95–106). Barcelona, Spain: Universitat Autònoma de Barcelona.

Roffey-Barentsen, J., & Malthouse, R. (2013). *Reflective practice in education and training* (2nd ed.). London, England: Sage.  
<https://doi.org/10.4135/9781526402134>

Rosen, R. (2012). *Anticipatory systems – Philosophical, mathematical and methodological foundations* (2nd ed.). New York, NY: Springer.

Rossiter, M., & Clark, M. C. (2007). *Narrative and the practices of adult education*. Malabar, Florida: Krieger.

Rubenson, K. (2004). Lifelong learning: A critical assessment of the political project. In *Shaping an emerging reality – Researching lifelong learning*. Graduate School in Lifelong Learning, Roskilde University Press.

Rudhumbu, N., Zhou, L. & Nhundu, K. (2017). Transdisciplinary research in higher education: Towards a paradigm for sustainable development. *IOSR Journal of Business Management*, 19(1).

Ruse, M. (2013). *The Gaia hypothesis: Science on a pagan planet*. Chicago: University of Chicago Press.  
<https://doi.org/10.7208/chicago/9780226060392.001.0001>

Ruskin, J. (1960). *The stones of Venice*. Cambridge, MA: Perseus.

Saari, A. & Mullen, J. (2018). Dark places: environmental education research in a world of hyperobjects. *Environmental Education Research*.  
<https://doi.org/10.1080/13504622.2018.1522618>

Salazar, J. F. (2011). The mediations of climate change: Museums as citizens media. *Museum & Society*, 9(2), 123–135.

Sandell, R., & Nightingale, E. (2012). *Museums, equality and social justice*. Abingdon, England: Routledge.

Schiller, F. (2012). *On the aesthetic education of Man and other philosophical essays*. Overland Park, KS: Digi-reads.

Schoeller, F. (2015a). Knowledge, curiosity, and aesthetic chills. *Frontiers in Psychology*, 6(1546), 1546. <https://doi.org/10.3389/psyg.2015.01546>  
[PMID:26539133](https://pubmed.ncbi.nlm.nih.gov/26539133/)

Schoeller, F. (2015b). The shivers of knowledge. *Journal of Social Sciences and Humanity Studies*, IV, 44–55.

Schoeller, F. & Perlovsky, L. (2016). Aesthetic chills: Knowledge-acquisition, meaning-making, and aesthetic-emotions. *Frontiers of Psychology*. 7:1093.  
<https://doi.org/10.3389/fpsyg.2016.01093>

Schön, D. A. (1983). *The reflective practitioner – How professionals think in action*. New York, NY: Basic Books.



- Schuller, T. & Watson, D. (2009). *Learning through life: Inquiry into the future for lifelong learning*. Leicester, England.
- Schumacher, E. F. (1995). *A guide for the perplexed*. London: Vintage.
- Scott, P. (1961). *The eye of the wind*. London, England: Hodder and Stoughton.
- Scruton, R. (1974). *Art and imagination – A study in the philosophy of mind*. London, England: Methuen.
- Segarra, V. A., Natalizio, B., Falkenberg, C. V., Pulford, S., & Holmes, R. M. (2018). STEAM: Using the arts to train well-rounded and creative scientists. *Journal of Microbiology & Biology Education*, 19(1), 1–7.  
<https://doi.org/10.1128/jmbe.v19i1.1360> PMID:29904562
- Semetsky, I. (2013). Learning with bodymind – Constructing the cartographies of the unthought. In D. Masny (Ed.), *Cartographies of becoming in education – A Deleuze-Guattari perspective*. Rotterdam, Netherlands: Sense.  
[https://doi.org/10.1007/978-94-6209-170-2\\_7](https://doi.org/10.1007/978-94-6209-170-2_7)
- Senge, P. (2000). *Schools that learn*. London, England: Nicholas Brealey.
- Shen, X. S., Chick, G. & Zinn, H. (2014). Validating the adult playfulness trait scale (APTS): An examination of personality, behaviour, attitude and perception in the nomological network of playfulness. *American Journal of Play*, 6(3), 345–369.
- Sherman, D. J. (Ed.). (2008). *Museums and difference*. Bloomington, IN: Indiana University Press.
- Sikes, P. (Ed.) (2013). *Autoethnography: Four volume set*. Thousand Oaks, CA: Sage.
- Sloterdijk, P. (2015). The Anthropocene: A process-state at the edge of geohistory. In H. Davis & E. Turpin (Eds.), *Art in the Anthropocene – Encounters among aesthetics, politics, environments and epistemologies*. London, England: Open Humanities Press.
- Small, C. (1975). Towards a philosophy of music education – part 2 – metaphors and madness. *Music in education*, 39(373).
- Small, C. (1997). Musicking: A ritual in social space, In *Oklahoma Symposium on music*, Richard Rideout (Ed.). Norman, Oklahoma: School of Music, University of Oklahoma.
- Smilek, D., Callejas, A., Dixon, M. J., & Merikle, P. M. (2007). Ovals of time: Time-space associations in synaesthesia. *Consciousness and Cognition*, 16(2), 507–519.
- Smith, J., Flowers, P., & Larkin, S. (2009). *Interpretative phenomenological analysis – Theory, method and research*. London, England: Sage.
- Snaza, N., & Weaver, J. (Eds.). (2015). *Posthumanism and educational research*. New York, NY: Routledge.

- Steedman, M. (Ed.). (2012). *Gallery as Community: Art, Education, Politics*. London: Whitechapel Gallery.
- Sterling, S. (2001). *Sustainable education – Re-visioning learning and change*. Cambridge, England: Green Books.
- Sterling, S. (2010). Transformative learning and sustainability: Sketching the conceptual ground. *Learning and Teaching in Higher Education*, 5.
- Stewart, I. (2013). *Symmetry – A very short introduction*. Oxford, England: Oxford University Press.  
<https://doi.org/10.1093/actrade/9780199651986.001.0001>
- Stewart, I., & Golubitsky, M. (1992). *Fearful symmetry – Is God a geometer?* Oxford, England: Blackwell Publishers.
- Stone, M. K., & Barlow, Z. (Eds.). (2005). *Ecological literacy – Educating our children for a sustainable world*. San Francisco, CA: Sierra Club Books.
- Stoneman, R. (2014). *Seeing is believing: The politics of the visual*. London, England: Black Dog Publishing.
- Tagore, R., & Elmhirst, L. K. (1961). *Rabindranath Tagore – Pioneer in education*. London, England: John Murray.
- Tallis, R. (2014). *Summers of discontent – The purpose of the arts today*. London, England: Wilmington Square Books.
- Tanke, J. (2009). *Foucault's philosophy of art – A genealogy of modernity*. London, England: Continuum.
- Taylor, C. A. (2013). Objects, bodies and space: Gender and embodied practices of mattering in the classroom. *Gender and Education*, 25(6), 688–703.  
<https://doi.org/10.1080/09540253.2013.834864>
- Taylor, C. A. (2016). Edu-crafting a cacophonous ecology: Posthumanist research practices for education. In Carol A. Taylor & Christina Hughes (Eds), *Posthuman Research Practices in Education*. Basingstoke, England: Palgrave Macmillan.
- Taylor, C. A. (2017). Is a posthumanist *bildung* possible? Reclaiming the promise of *bildung* for contemporary higher education. *Higher Education*, 74(3), 419–435. <https://doi.org/10.1007/s10734-016-9994-y>
- Taylor, C. A., & Gannon, S. (2018). Doing time and motion diffractively: Academic life everywhere and all the time. *International Journal of Qualitative Studies in Education : QSE*, 31(6), 465–486.  
<https://doi.org/10.1080/09518398.2017.1422286>
- Taylor, C. A., & Hughes, C. (Eds.). (2016). *Posthuman research practices in education*. Basingstoke, England: Palgrave Macmillan.  
<https://doi.org/10.1057/9781137453082>
- Taylor, E. W. (2008). Transformative learning theory. In S. B. Merriam (Ed.), *Third update on adult learning theory. New Directions for Adult and Continuing*

*Education*, 119. San Francisco, CA: Jossey Bass.

<https://doi.org/10.1002/ace.301>

Taylor, E. W., & Cranton, P. (2012). *The handbook of transformative learning*. San Francisco, CA: Jossey Bass.

Taylor, M. (2014). 'Strategic transformation – Museums in the 21<sup>st</sup> century. *Speech to Future Museums Conference*, Kolkata, India, February 2014.

Telfer, B., Shepley, E., & Reeves, C. (Eds.). (2011). *Re-framing disability*. London, England: Royal College of Physicians.

Tett, L. (2002). *Lifelong learning policies: four fallacies and an interrogation*. Paper presented at SCUTREA, 32<sup>nd</sup> Annual Conference, July 2002, University of Stirling.

Tett, L. & Fyfe, I. (2010). *Community education, learning and development*. Edinburgh, Scotland: Dunedin.

Thomas, G., & Pring, R. (Eds.). (2004). *Evidence based practice in education*. Buckingham, England: Open University Press.

Thomassen, B. (2018). Thinking with liminality. In A. Horvath, B. Thomassen, & H. Wydra (Eds.), *Breaking boundaries – Varieties of liminality*. New York, NY: Bergahn Books.

Thompson (2002). *Bread and roses: Arts, culture and lifelong learning*. Leicester, England: NIACE.

Thoreau, H. (1995). *Walden; or, Life in the woods*. New York, NY: Dover. (Original work published 1854)

Tilley, C. (1994). *A phenomenology of landscape: Places, paths and monuments*. Oxford, England: Berg Publishers.

Tilley, C. (2008). *Body and image – Explorations in landscape phenomenology* 2. Walnut Creek, CA: Left Coast Press.

Toadvine, T. (2010). Ecological aesthetics. In H. R. Sepp & L. Embree (Eds.), *Handbook of phenomenological aesthetics*. New York, Heidelberg: Springer.

Todd, S. (2014). Between body and spirit: The liminality of pedagogical relationships. *Journal of Philosophy of Education*, 48(2), 231–245.

<https://doi.org/10.1111/1467-9752.12065>

Tonner, P. (2015). *Phenomenology between aesthetics and idealism*. Colorado: Noesis Press.

Trehub, S. E., & Thorpe, L. A. (1989). Infants' perception of rhythm: Categorization of auditory sequences by temporal structure. *Canadian Journal of Psychology*, 43(2), 217–229. <https://doi.org/10.1037/h0084223>  
[PMID:2486496](https://pubmed.ncbi.nlm.nih.gov/2486496/)

Tschumi, B. (1996). *Architecture and Disjunction*. Cambridge, MA: MIT Press.



- Tuan, Y.-F. (1977). *Space and Place: The Perspective of Experience*. Minneapolis: University of Minnesota Press.
- Tuijnman, A., & Bostrom, A. (2002). Changing notions of lifelong education and lifelong learning. *International Review of Education*, 48(1/2), 93–110.  
<https://doi.org/10.1023/A:1015601909731>
- Turner, V. (1969a). Liminality and Communitas. In Turner, V. (Ed.). *The Ritual Process: Structure and Anti-Structure* (pp. 94–113). Chicago: Aldine Publishing.
- Turner, V. (1969b). *The Ritual Process: Structure and Anti-Structure*. New York: Aldine and Gruvter.
- Ulmer, J. B. (2017). Posthumanism as a research methodology: Inquiry in the Anthropocene. *International Journal of Qualitative Studies in Education : QSE*, 30(9), 832–848. <https://doi.org/10.1080/09518398.2017.1336806>
- Vaughan, R. (2001). Images of a Museum. *Museum Management and Curatorship*, 19(3), 253–268. <https://doi.org/10.1080/09647770100301903>
- Van Leeuwen, L. & Westwood, D. (2008). Adult play, psychology and design. *Digital Creativity*, 19(3), 153–161.
- Van Leeuwen, P., Geue, D., Lange, S., Cysarz, D., Bettermann, H., & Grönemeyer, D. H. (2003). Is there evidence of fetal-maternal heart rate synchronization? *BMC Physiology*, 3(1), 2. <https://doi.org/10.1186/1472-6793-3-2> PMID:12702214
- Van Straassen, B. C. (1989). *Laws and Symmetry*. Oxford: Clarendon Press.
- Van Weert, T. J., & Kendall, M. (Eds.). (2004). *Lifelong Learning in the Digital Age. Sustainable for all in a changing world*. Boston: Kluwer Academic.  
<https://doi.org/10.1007/b109540>
- Vellend, M. (2016). *The theory of ecological communities*. Princeton, NJ: Princeton University Press. <https://doi.org/10.1515/9781400883790>
- Verdi, M. P., Johnson, J. T., Stock, W. A., Kulhavy, R. W., & Whitman-Ahern, P. (1997). Organised displays and texts: Effects of presentation order and display type on learning outcomes. *Journal of Experimental Education*, 65, 303–317.
- Vince, G. (2014). *Adventures in the Anthropocene*. London: Penguin Vintage.
- Von Laban, R. (1920). *Die Welt der Tanzers*. Stuttgart: Stuttgart Press.
- Vygotsky, L. S. (1978) *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Wakkary, R. & Evernden, D. (2005). Museum as ecology: A case study analysis of an ambient intelligent museum guide. *Museums and Web: Selected Papers from an International Conference*, pp.151–164.  
<http://www.archimuse.com/mw2005/papers/wakkary.html>
- Wallin, J. J. (2017). Pedagogy at the brink of the post-anthropocene. *Educational Philosophy and Theory*, 49(11), 1099–1111.  
<https://doi.org/10.1080/00131857.2016.1163246>

- Ward, J. (2008). *The Frog Who Croaked Blue – synaesthesia and the mixing of the senses*. London, New York: Routledge.
- Ward, J., Hoadley, C., Hughes, J., Smith, P., Alison, C. Baron-Cohen, S. & Simner, J. (2017). Atypical sensory sensitivity as a shared feature between synaesthesia and autism. *Science Reports*, 7, 4155. Doi:10.1038/Srep41155
- Warren, W., & Shaw, R. E. (Eds.). (1985). *Persistence and Change*. Hillside, NJ: Lawrence Erlbaum Associates.
- Webster, P. (1988). Creative thinking in music education. *Design for Arts in Education*, 89(5), 33–37.
- Wenger, E. (1998). *Communities of practice: learning, meaning and identity*. Cambridge: Cambridge University Press.  
<https://doi.org/10.1017/CBO9780511803932>
- West-Burnham, J. & Harris, D. (2015). *Leadership dialogues: Conversations and activities for leadership teams*. Carmarthen, Wales: Crown House.
- Weyl, H. (1969). *Symmetry*. Princeton: Princeton University Press.
- Wilber, K. (1983). *Eye to Eye: The Quest for a New Paradigm*. Garden City, NY: Anchor Books.
- Whitehead, A. N. (1920). *The concept of nature*. Cambridge, UK: Cambridge University Press.
- Whitehead, A. N. (1968). *Modes of thought*. New York, NY: The Free Press.
- Wigner, E. P. (1967). *Symmetries and Reflections*. Bloomington, Indiana: Indiana University Press.
- Wiscus, J. (2015). *The Rhythm of Thought: Art, Literature, and Music after Merleau- Ponty*. Chicago: The University of Chicago Press.
- Yarnal, C. & Qian, X.
- Witcomb, A. (2013). Understanding the role of affect in producing a critical pedagogy for history museums. *Museum Management and Curatorship*, 28(3), 255–271. <https://doi.org/10.1080/09647775.2013.807998>
- Wylie, J. (2016). A landscape cannot be a homeland. *Landscape Research*, 41(4), 408–416. <https://doi.org/10.1080/01426397.2016.1156067>
- Yarnal, C. & Qian, X. (2012). Older-adult playfulness: an innovative construct and measurement for healthy ageing research. *American Journal of Play*, 4(1), 52–79.
- Yoon, H., Choi, S. H., Kim, S. K., Kwon, H. B., Oh, S. M., Choi, J.-W., . . . Park, K. S. (2019). Human Heart Rhythms Synchronize While Co-sleeping. *Frontiers in Physiology*, 10, 190. <https://doi.org/10.3389/fphys.2019.00190>  
[PMID:30914965](https://pubmed.ncbi.nlm.nih.gov/30914965/)

Zajonc, R. B. (1980). Feeling and thinking: Preferences need no inferences. *The American Psychologist*, 35(2), 151–175. <https://doi.org/10.1037/0003-066X.35.2.151>

Zajonc, R. B. (1984). On the primacy of affect. *The American Psychologist*, 39(2), 117–123. <https://doi.org/10.1037/0003-066X.39.2.117>

Zandvliet, D. (Ed.). (2013). *The Ecology of School*. Rotterdam, Netherlands: Sense. <https://doi.org/10.1007/978-94-6209-221-1>